THE
NAUTILUS

A QUARTERLY JOURNAL
DEVOTED TO THE INTERESTS
OF CONCHOLOGISTS

VOL. 65
JULY, 1951 to APRIL, 1952

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LANCASTER PRESS, INC., LANCASTER, PA.

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THE NAUTILUS

Vol. 65 JULY, 1951 No. 1

A NEW WEST AMERICAN NUDIBRANCH MOLLUSK

By G. D. HANNA

California Academy of Science

A few minutes before Dr. F. M. MacFarland collapsed on February 21, 1951, he discussed with me the generic position of a rather remarkable species of nudibranch which had been collected a few weeks previously. He unquestionably would have described this animal in his very thorough manner had fate permitted. As a poor substitute, I will endeavor to place it on record and it seems fitting that it be named for him.

PLATYDORIS MACFARLANDI, **new species.** Plate 2, figures 1–5.

Animal greatly flattened and broadly oval in shape; deep dark red above when alive, fading to a dull vinaceous gray in alcohol; light gray, almost white below; mantle flexible and edges sharp. Rhinophores placed 8 mm. from the anterior mantle margin and separated by 11 mm.; they are retracted as preserved leaving two small lighter colored knobs. Gill retracted into aperture which is centrally located and 13 mm. from posterior margin of mantle. Otherwise, upper surface dull velvety smooth. Foot truncate anteriorly, tapering to a point posteriorly. Labial palps well developed. Reproductive aperture on the right side, 10 mm. back from the head; cloaca evaginated in the holotype, but the spicular lining not showing; this is very apparent in one of the paratypes.

Holotype No. 9510, Calif. Acad. Sci. and paratypes (nos. 9511, 9512) from Loc. 33,248, C. A. S., collected October 23, 1950, off Pismo Beach, San Luis Obispo Bay, 86–88 fms., by Wm. Ellis Ripley, Keith W. Cox, and J. B. Phillips of the Calif. Division of Fish and Game while conducting fishery investigations with the vessel *N. B. Scofield;* (Fish and Game) field No. 50–B–59. One additional specimen was collected 7–10 miles southwest of Pt.

San Luis in 70–110 fms. Loc. 33,249, C. A. S. From 11/5/50 to 11/7/50.[1]

Dr. MacFarland told me that these specimens belonged to the genus *Platydoris* Bergh,[2] the description of which is repeated in the Zool. Rec. for 1877, Moll., p. 51. Sixteen species were included, the first being "*D. argo* (argus)" (L.). Most of these are from European waters, but one, *alaleta,* is recorded from the West Indies and one is from the Philippine Islands. He also stated that there was a possible conflict of this genus-name with "*Argus*" of Bohadsch.[3]

Bohadsch's names have been a source of confusion for many years. Pilsbry[4] rejected them on the ground that the work was not binomial. Iredale and O'Donoghue[5] adopted them, however. Sherborn[6] listed both "*Argo*" and "*Argus*" as of Bohadsch 1761, the first in quotes followed by "Herrmannsen V. *Argus.*" No species were cited under either name because Bohadsch considered a species-name unnecessary when there was only one in a genus. Both genus names, *Argo* and *Argus,* are listed in the Berlin Nom. Animal. gen. & subgen., 1926, Vol. 1, and in Neave, Nom. Zool., 1939, Vol. 1.

Engel[7] discussed the status of the names of Bohadsch at length and on pp. 533–534 he considered the name *Argus,* which he said "is our *Platydoris argo.*" Although Bohadsch cited no specific name in connection with the description of the genus *Argus,* Engel stated: "When a man quotes the rules of Linnaeus, tries to use them, discusses their application, it is my opinion that his work has to be regarded as valid, unless it be invalidated by an opinion of the Commission on Nomenclature. As Linné's

[1] This nudibranch was collected somewhere between stations 50 B.72 and 50 B.82, Nov. 5, 6, and 7, 1950. The area dredged was off Pismo Beach. Worked both north and south, 7–10 miles. The specimens turned in were all together in one jar and labeled stations 50 B.72–82—Nov. 5, 6, and 7th, 1950.

[2] Bergh, R. Kritische Untersuchen der Ehrenberg'schen Doriden. Jahrb. d. Malakozool. Ges., Vol. 4, 1877, pp. 73–74.

[3] Bohadsch, J. B. De Quibusdam Animalibus Marinis, 1761, pp. 65–74, pl. 5, figs. 4–5.

[4] Pilsbry, Proc. Acad. Nat. Sci. Philadelphia, 1895, pp. 347–350.

[5] Iredale and O'Donoghue, Proc. Mal. Soc. London, Vol. 15, 1923, p. 195.

[6] Sherborn, C. D., Index Anim., 1758–1800 (1902), p. 73.

[7] Engel, H., Ann. Mag. Nat. Hist. (10), Vol. 13, May, 1934, pp. 529–540.

Rules asked for no specific name in a monospecific genus, it is quite clear that *Argus argus* is the type-species of the genus *Argus.*" Acting upon this belief Engel asked for an opinion from the Commission in regard to the validity of Bohadsch's names. This was rendered on October 17, 1945 (Opinion No. 185), the title of which is as follows: "Suppression of Bohadsch (J.B.), *De quibusdam animalibus marinus,* 1761, and of the German translation thereof published by Leske (N.G.) in 1776." There was no dissenting vote among the commissioners so that the early name *Argus* of Bohadsch is purely of academic interest at this time.

NOTES ON SOME BRAZILIAN PLANORBIDAE

By H. A. PILSBRY

In the course of investigating some Planorbidae for Dr. Ottis R. Causey, of the International Health Division, Rockefeller Foundation, certain forms were encountered which gave occasion for the following descriptions and notes.

Australorbis amphiglyptus, **new species.** Vol. 64, plate 9, figs. 6, 6a.

The discoidal shell has on the left side a deep conical concavity with subangular (narrowly rounded) border; the right side is very slightly concave, nearly level, with subangular border. The periphery is rounded. The surface is smooth in the peripheral zone, strongly costulate in both right and left concavities, the riblets regular, in the direction of lines of growth; wanting on the first two whorls. The aperture is rather narrow, less oblique than usual in this genus, the outer margin being straight in profile.

Height 6 mm., diameter 13.5 mm.; 4½ whorls.

"Rio de Janeiro, Brazil," received from the Smithsonian Institution. Type 21635 ANSP.

The chief differential feature of this planorb is the strong, regular costulation of the walls of the right and left concavities, not found in any other *Australorbis* seen or found in a search through the literature.

It has been in the collection of the Academy for many years. Some doubt of the locality may be entertained as it does not seem likely that so distinct a snail could have escaped notice in that locality, which has been visited by many naturalists, and where Dr. Lutz made an extensive study of Planorbidae.

AUSTRALORBIS BAHIENSIS MEGAS, **new subspecies.** Vol. 64, plate 9, figs. 4, 4a, 5.

The discoidal shell has on the left side a rather deep cup-shaped or conical concavity with flattened sides and an angular boundary. The right side is flattened, with a smaller broadly conical central concavity, and is bluntly angular near the rounded periphery, the greatest convexity of the peripheral curve being nearer the right side. The last whorl is rather wide, the width of the spire, measured on the right side, being about 53 to 57 percent of the total diameter. The surface is rather smooth, but shows fine wrinkles of growth under a lens. The color of the type lot is sepia, but in several other lots more of a tawny olive tint. The aperture is somewhat squarish but the outer margin rounded, inclined about 45° to the axis, but the obliquity is mainly in the left or lower half, the plane of the right half being nearly parallel to the axis. The outer lip is therefore concave in a profile view.

Height 9.4 mm., diameter 26.5 mm.; about 6 whorls. Type.
Height 11 mm., diameter 30 mm.; 6½ whorls.

Petropolis, state of Rio de Janeiro, Brazil. Type 186903 ANSP.

In this race the shell is larger and especially higher than *A. bahiensis* (Dunker), and the whorls increase more rapidly, the last whorl, on the right side, being much wider relative to the spire than in *A. bahiensis.*

Dr. J. B. de Spix, who made extensive collections in the province of Bahia and the Amazon valley, died before writing up his mollusks. He left a series of plates drawn on stone, with the names of his species lettered at the foot. Dr. J. A. Wagner was engaged to supply the text. He had little regard for Spix's names, substituting Lamarckian genera for new genera proposed by Spix, and he frequently changed the specific names. In the publication "Testacea fluviatilia Brasiliensis" (1827) both the Wagner and the Spix names are lettered on the plates, but in

the text Spix's names, when differing from Wagner's, are placed in synonymy.

Planorbis lugubris Wagner [1] has embarrassed all conchologists who have dealt with Brazilian planorbs. It was described from a specimen not figured, said to measure 3½ lines high, 10½ wide (that is, about 22 mm. diameter), with four rounded whorls, the last one inflated, cylindric. Wagner referred to an ambiguous figure in Chemnitz, of about 15 mm. diameter, which may represent *Helisoma caribbaeum* (Orbigny) or something similar, as it is said to be "von Westindien." Wagner included two forms of *lugubris:*

"a) Testa adulta, majore. [This is evidently the specimen he described.]

"b) Testa juniore, minore: *Planorbis nigricans, albescens* et *viridis* Spix, Tab. xviii, fig. 3, 4, 5, 6."

These species of Spix were from woodland brooks at Ilheos and Almada, province of Bahia.

Professor Von Martens had an opportunity to examine the originals of Spix's figures. He gave the results in Malak, Blätter, 15: 188, as follows:

". . . das Original zu Fig. 4 und 5, *Pl. nigricans* Spix (nicht Fig. 3, wie auf der Tafel steht),[2] hat die Kanten kaum angedeutet, aber die Windungen doch ziemlich rasch, wie bei *tenagophilus* zunehmend; dasjenige zu Fig. 6, *nigricans* [error for *viridis*] Spix, ist kleiner, unten weniger tief und hat die Kanten, namentlich die obere, besser ausgeprägt, es nähert sich also noch mehr dem *Pl. tenagophilus.* Das Original zu Fig. 3, *Pl. albescens Spix,* scheint gar nicht hieher, sondern zu *olivaceus* zu gehören."

It would seem that Spix's figures 4 and 5 (*nigricans* Spix) agree with Wagner's description in having scarcely any indication of carinae. Fig. 4 measures 14.7 mm. in diameter, while Fig. 6 (*viridis* Spix) is smaller and has a better developed keel.[3]

[1] Test. fluv. Brasil., p. 27.

[2] In the numbering of Spix's plate the numbers 3 and 5 are exchanged.

[3] Dr. Adolfo Lutz described and figured a strongly carinate species under the name *Planorbis nigricans* Spix (Mem. do Instituto Oswaldo Cruz, vol. 10, fac. 1, p. 51, 1918), but it certainly is not that species though possibly it may be *viridis* Spix.

MARINE BIOLOGICAL LABORATORY WOODS HOLE LIBRARY

In our older collections there are specimens labeled *P. lugubris* which agree fairly with Spix's *P. nigricans* so far as can be seen; but Spix gave only a view of one side, and there is no description of his shells.

What is needed to clear the situation is a good collection from the state of Bahia. In any case, it seems that *P. bahiensis* Dunker is distinct from *P. lugubris* Wagner, whatever that may be.

NEW FLORIDAN SPECIES OF OSTREA AND VERMICULARIA

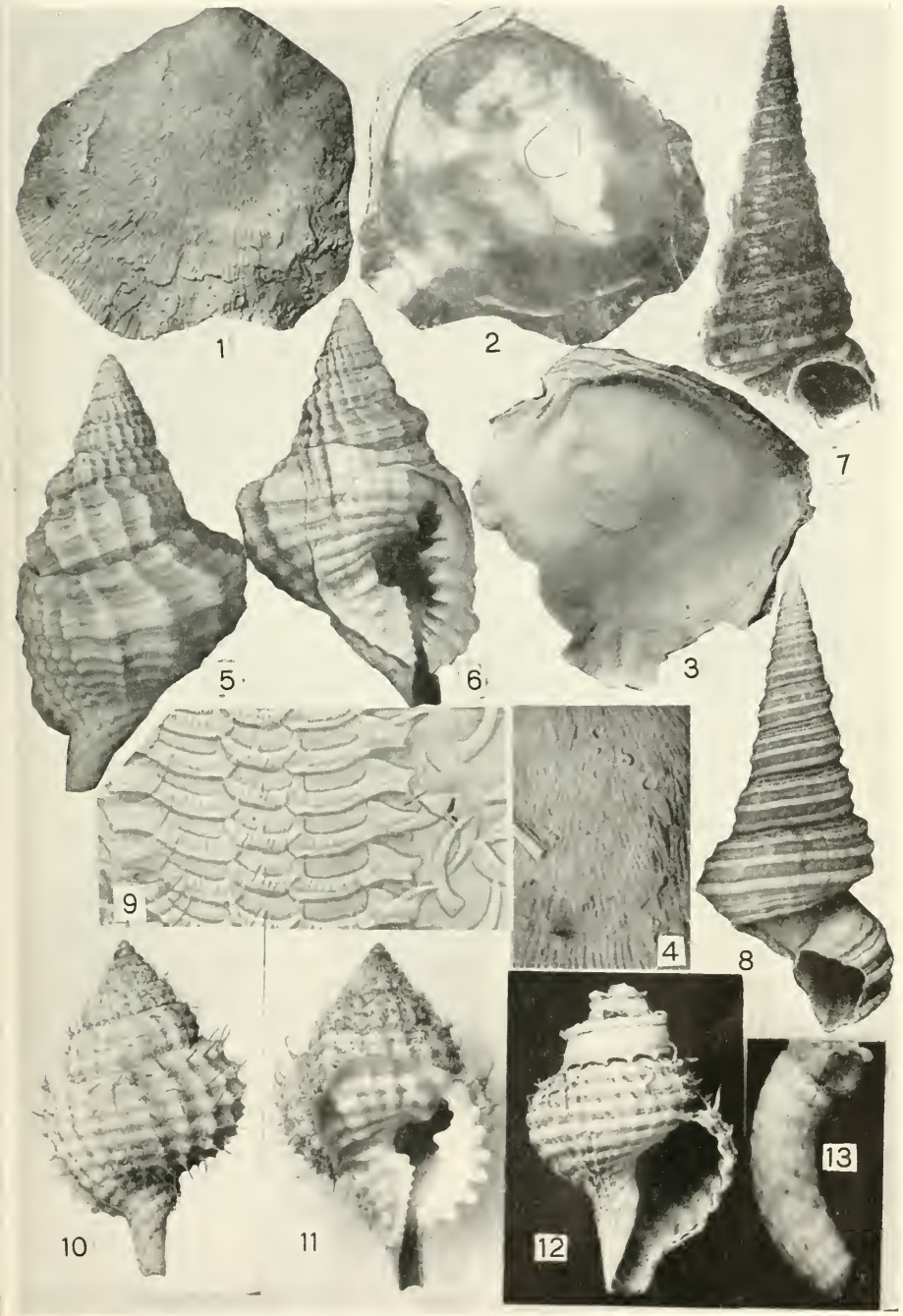
By AXEL A. OLSSON

Ostrea weberi, **new species.** Plate 1, figs. 1, 2, 3, 4.

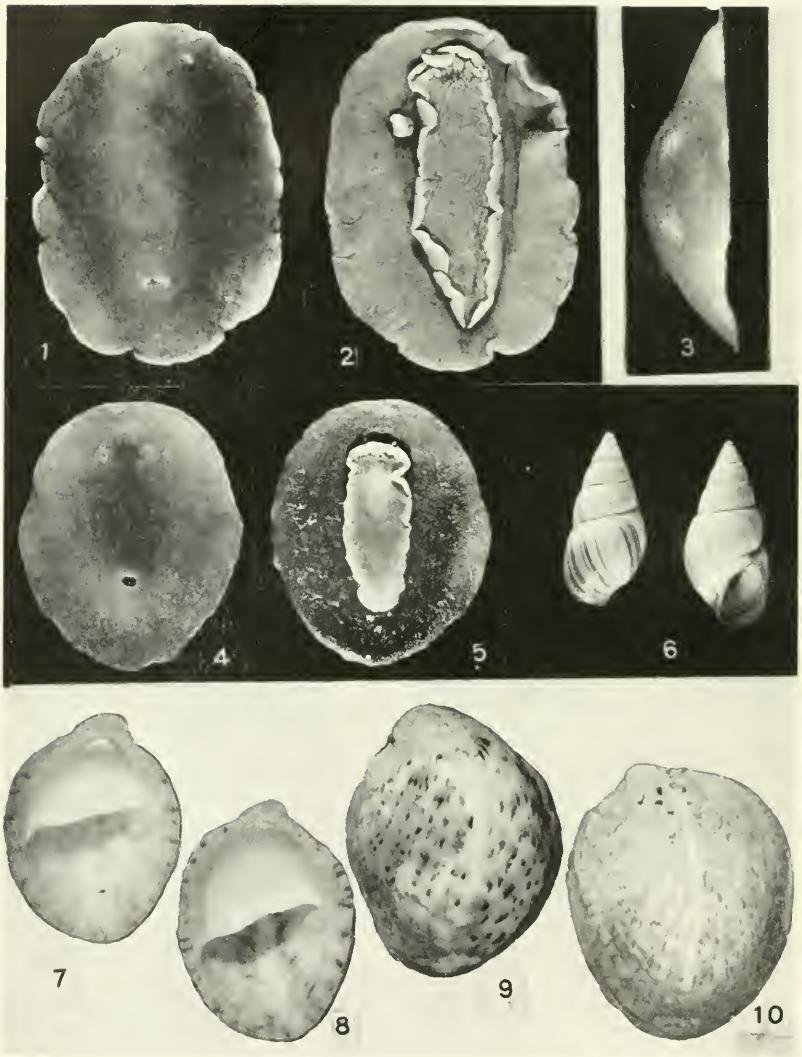
Shell *Anomia*-like, thin, amber or apricot colored, attached usually by the whole surface of the lower valve, hence more or less irregular in form by conforming to the rock bed underneath but with a general tendency for the outline to approach subcircular. Cardinal area narrow, turned towards the posterior side, with the ligament furrow in the middle, the area itself terminating in a small inconspicuous beak pointing backwards. The lateral margins on each side of the cardinal area are minutely denticulated, pits in the left valve and small pustules in the right; in some specimens these denticulations may be nearly obsolete. Outer surface of upper valve covered with fine, radial threads which are more or less divaricate along the middle and spread out fanlike on the ventral portion (fig. 4). The surface of the lower valve where it has become free or detached without causing injury, is smoother with waved growth-lines, the radials almost or wholly obsolete, its color white or pink with faint rays sometimes showing on the extreme umbo. Interior shiny, subnacreous, the muscle scar, posterior in position, small and semilunate. Valve margin is bordered by a darker zone, quite wide, formed by the growing outer layer.

Type, an upper valve from Key West: Height from beak to ventral margin 37.1 mm., diameter across the sides 37.9 mm.

This fine species, wholly distinct from any other oyster known from Atlantic waters, will be recognized at once by its *Anomia*-like shell, deep, rich color and fine, thread-like, radial sculpture of its upper valve. Although so much smaller, and always thin



1–4, *Ostrea weberi*. 5, 6, 9, *Distorsio floridana*. 7, 8, *Serpulorbis fargoi*. 10–12, *Distorsio clathrata*. 13, *Caecum biminicola*.



FIGS. 1–3. *Platydoris macfarlandi* Hanna, n. sp. Holotype No. 9510, Calif. Acad. Sci. Dept. Paleo. Type Coll.

FIGS. 4–5. *Platydoris macfarlandi* Hanna, n. sp. Paratype No. 9511, Calif. Acad. Sci. Dept. Paleo. Type Coll.

FIG. 6. *Drymaeus multilineatus choreus* Grimshawe.

FIGS. 7–10. *Crepidula maculosa* Conrad. Sanibel Island.

and delicate, *Ostrea weberi* is evidently nearest to *O. iridescens* Gray of the Panama-Pacific fauna. Young specimens of *iridescens* have the same wide marginal band formed by the deeply colored outer layer, fine, threadlike riblets, and denticulated dorsal margins. Both species are completely marine.

We take pleasure in naming this species for Mr. Jay A. Weber of Miami, Florida, who discovered it several years ago, at its two known localities, Key West and on the Gulf side of Grassy Key.

Type and paratype 187641 ANSP from Key West.

VERMICULARIA FARGOI, **new species.** Plate 1, figs. 7, 8.

Adult shell large, the living animal free, apparently never attached at any time. The *Turritella* stage is large (in the type about 35 mm. in length and composed of 12 whorls), formed of normally coiled whorls between closed sutures, its base openly umbilicate and forming a narrowly perforate axis continuous through the length of the spire. As the coiling relaxes, at first in a strictly spiral manner, the tube finally becomes drawn-out, worm-like and irregular with no fixed pattern of growth. Sculpture strong to moderate; on the spire-whorls it is formed by three primary spiral cords, one placed at the shoulder, a second around the middle, and a third lies partly buried in the suture but becomes exposed as the suture opens. The last whorl has therefore 3 strong, nearly equal spiral cords on its outer surface. A strong cord also forms the edge of the umbilicus producing a small but distinct canal at the base of the lip. Space between the primary spiral cords is flat and marked with fine spiral threads and sinuated lines of growth. Base of tube between the peripheral and umbilical cords is flattened and finely sculptured and a similar type of sculpture is found on the umbilical wall. Color in life is usually a dark-brown or ashy-blue, the primary cords flecked with brown spots.

Holotype: Length 35.5 mm. fig. 8. No. 187640 ANSP.

Paratype: Length 33.5 mm. fig. 7.

This is a common species in Tampa Bay, where it was observed crawling about on the mud-flats at the cable crossing near Pass-a-Grille by Mr. William Fargo, Jay Weber and the writer during the past winter months. The types, of which measurements are given above, are not completely mature but were selected because of their well-preserved spires. Large specimen may have a length of 70 mm. with the tube drawn out and twisted.

All the specimens collected or observed were individually free, none entangled together as is common among other members of the genus. It has been customary to lump all vermicularias into a single species, *V. spirata* Philippi, but it is evident that several distinct forms occur; collectors are advised to watch for these interesting shells and to obtain them alive if possible. Nothing seems to be known as to the exact habitat of *V. spirata,* and its soft parts should be studied.

THE MOLLUSCAN NAMES IN RENIER'S "TAVOLE"

By A. MYRA KEEN

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Compilers of systematic lists in the Mollusca find it virtually impossible to verify and evaluate generic names attributed to S. A. Renier, for Renier's publications are almost non-existent. Only a single surviving copy of the original folio edition of the "Tavole" is on record, in the library of the University of Padua. A photographic copy of this is in the British Museum (Natural History), and a second one is now available in the United States. Other unrecorded examples may, of course, exist.

Iredale (1922, pp. 87–90) reviewed the British Museum copy, and his useful notes have been virtually the only information on Renier hitherto available. He dismissed most of the names as unacceptable on the ground that, like Poli's, Renier's are in duplicate and hence, he felt, non-binomial. Now, however, Poli's names are gradually gaining acceptance. It seems well, then, to examine Renier's work anew, especially as Iredale overlooked one name and did not discuss all of the problems involved.

In the bibliography of the "Index Animalium," Sherborn (1922, p. cvii) listed Renier's publications with these comments:

Prodr. osserv. Venezia 1804–7 (Not published except as the following:)

Tavola alfab. Conch. Adriat. 1804.
Prosp. classe dei Vermi. 1804.
Tavola per serv. conosc. classif. Anim. 1807.

. . . [These] . . . were loaned to me by the University of Padua, they are 30 single sheets folio, and photographic re-

productions were carefully made for the British Museum (Natural History).

Evidently a duplicate photographic copy was made by Sherborn for his own library. After his death it was listed by a British dealer and purchased by the library of Stanford University. Bound into this copy are some typewritten notes and a collation in Sherborn's hand-writing signed and dated April, 1905.

All three of Renier's papers are the initial parts of unfinished works. The first was adequately reviewed by Iredale. The second dealt mainly with worms. Like other workers of his day, however, Renier grouped a number of molluscan genera in Vermes. Among the latter were some innovations—*Scolixedion,*[1] which will be discussed below. *Discoides,* indeterminate as of 1804 but described in 1807, and *Aglaia,* also undescribed in 1804 but validated in 1807 under the spelling *Aglaja.*

Renier's third work, the one most often cited, is entitled, "Tavole per servire alla classificazione e connoscenza degle animali." It consists of eight synoptic tables covering five of the eleven classes into which he divided the animal kingdom.

Although in his bibliography, quoted above, Sherborn listed the date of the Tavole as 1807 and imprinted this date upon his own copy, for some unexplained reason he dated all Renier's genera as "[1804]." In the earlier parts of the "Index Animalium" he did not cite those names of Renier ending in *-genus.* As Schultze *et al.* (1926–), however, included these in the "Nomenclator Animalium Generum et Subgenerum" published by the Berlin Academy, Sherborn later, in his volume of additions and corrections (1932), listed them all with the strange notation, ". . . Renier, 1807 (i.e., 1804) . . . *teste* Nomen. Anim." This action upon the part of one so careful about dates is difficult to understand. Neave (1939–1940) altered most of the references to "[1804] 1807."

[1] Among the few errors of recording made by Sherborn is his entry for *Scolixedion.* The reference is given as Tavole, xx [1804], which should read, "Prosp. . . . Vermi, xx, 1804." There is also a typographical error in the quotation from Sherborn's bibliography given above. He listed Renier's third paper as "Tavola" (the singular form of the word) instead of "Tavole" (the plural) which he used elsewhere in the Index.

In order that the reader may have a clearer idea of Renier's system, here are some sample entries from Tables VII and VIII, taken at random near the top of each table. Three columns of vernacular names are omitted; these alternate with the scientific names.

Tavola VII

Classe V. MOLLUSCHI

Sezione I. Molluschi Acefali

Nome generico dei Molluschi	Nome generico delle conchiglie	Nome specifico di alcuni conchiglie
1. *Teredigenus*	*Teredo*	*Ter. navalis* Lin. *Ter. bipalmulata* Cuv. Red.
2. *Pholadigenus* ..	*Pholax* [sic]	*Ph. costata* Lin.
3. *Fistulanigenus* .	*Fistulana* Lam.	*Ter. clava* Gmel.
4. *Saxicavigenus* ..	*Saxicava* Fle. Bel.	*Sax. striata* Fle. Bel.

Tavola VIII

Sezione II. Molluschi Cefalati

75. *Siliquarigenus* .	*Siliquaria* Lam.		*Serp. anguina* Gmel.
76. *Vermicularigenus*	*Vermicularia* Lam.		*Serp. lumbricalis* Lin.
77. *Arenarigenus vel Scolixedion*	*Arenaria*	La conchiglia L'animale ..	*Serp. arenaria* Lin. *Scol. penulatum* Ren.

In all, 163 genera were mentioned, but 15 of these are no longer considered mollusks (brachiopods, corals, barnacles, etc.), so that the total is really 148 molluscan genera of which 63 are Pelecypoda, 85 Gastropoda. Under a subhead, "Conchiligeni: Nudi," in Tav. VIII, Renier listed several nudibranch genera. Only one, *Discoides,* is new. The name had been published in the Prospetto . . . Vermi in 1804 as a nude name based on an undescribed species. In the Tavole it is validated by a description,[2] provided specialists can recognize the form described.

[2] The description reads,

Dorso variocolorato. Ventre unicolare. Testa anteriore tra i margini membranosi, quadrata, schiacciata, con la bocca inferiormente, per la quale esce proboscide tubulosa macchiata. Tentacoli quattro, anteriori, senza occhi, due sotto il margine superiore, sopra il collo, orecchiformi, congiunto alle base, e due laterali nell'estremita della testa. Aperture due approssimata, anteriori e laterali a destra; l'una per gli organi feminini, l'altra per i mascolini. Membro cirriforme, lungo, indiviso, imperforato? Senza conchiglia. Barcola vagando.

Under a second subhead, "Conchiglie univalvi," *Aglaja* is listed, with a marginal description [3] in the form of a key. The generic name had been spelled *Aglaia* in the "Prospetto . . . Vermi," 1804, with *Aglaja* as the vernacular form, but in Tavola VIII it is recorded as *Aglaja* without alternative.

If, for the sake of argument, one grants that all of Renier's names are to be accepted at face value, two courses of action are open: 1) To regard all of the names in the first column as emendations of names in the second, which would seem to be in line with principles of emendation recently set forth by the International Commission on Zoological Nomenclature (1950, p. 148). 2) To evaluate each name in column 1 on its own merit, in terms of the species cited in the third column.

Under the first alternative, most of the names of column 1 disappear, for nearly all of them are based on names of Linnaeus, Lamarck, Cuvier, and others, the ending *-genus* being added. They would fall as absolute synonyms with the same type species, whether or not that species was cited by Renier. However, a few Lamarckian names are homonyms, and an otherwise invalid emendation would become available for use in replacement. A complete list of these, plus the innovations which Renier proposed, is as follows, preserving Renier's style and order:

The sole species is *Discoides nutans* Renier. Later authors have synonymized *Discoides* with *Pleurobranchus* Cuvier, but Renier, although bracketing the two under a larger category in his marginal key, distinguished *Discoides* as being without, *Pleurobranchus* with, internal shell.

[3] This description reads:

> Corpo cilindraceo, anteriormente rotondato, ed un poco schiacciato; posteriormente troncato; privo di tentacoli, e di occhi. Ventre smarginato [?emarginato]. Bocca in una fessura orizzontale anteriore, e per la quale il primo ventricolo rovesciandosi esce in forma di proboscide. Prolungamenti del manto membranosi due, liberi, aliformi, estesi, uno per lato; un terzo anteriore e superiore, aderente al dorso, libero ai margini; un quarto posteriore formato a disco, in alcuni (*A. dipinta*) diviso superiormente ed inferiormente, in alteri (*A. tricolorata*) soltanto inferiormente e con appendice. Branchie laterali destre e posteriori, pinnate ed unite in piramide, coperte dei prolungamenti del manto. Ano posteriore nel mezzo al disco.

The names of the two species, given in the description in vernacular form, are recorded in the table in the latinized form, *Agl. depicta* and *Agl. tricolorata*. Although this is under the subhead "Conchiglie univalvi," the words "senza conchiglia interna" precede the description.

3. *Fistulanigenus* ...	*Fistulana*	*Ter. clava* Gmelin
11. *Panopeigenus*	*Panopea* Fauj.	*Pan. aldrovandi* Fauj. *Pan. faujas*
23. *Galateigenus*	*Galatea* Lam.	*Gal. radiata* Lam.
44. *Hirundigenus*	*Avicula*	*Myt. hirundo* Lin.
52. *Marginelligenus* ..	*Marginella* Ren.	*Mar. subtilissima* Ren.
55. *Cystigenus*	*Cystia* Ren.	*Cyst. nivea* Ren. *Ost. bullata* Bor.
56. *Imisigenus*	*Imisia* Ren.	*Im. bisulcata* Ren.
77. *Arenarigenus vel Scolixedion*	*Arenaria*	*Serp. arenaria* Lin. *Serp. penulatum* Ren.
86. *Planospirigenus* ..	*Planospira* Fauj.	*Pl. ostracina* Fauj.
131. *Nassigenus*	*Nassa*	*Buc. arcularia* Lin.

If Sherborn's citation of the date 1804 for the Tavole were correct, two generic names in current usage would fall: *Egeria* Roissy, 1805, might be displaced by *Galateigenus* (*Galatea* Lam. is a homonym); and *Nassarius* Duméril, 1806, itself an emendation of the homonymous *Nassa* Lamarck, might be replaced by *Nassigenus*. However, the occurrence of the name *Panopea* argues strongly against a date as early as 1804. It is true that Renier cited *Panopea* as of Faujas rather than Ménard,[4] but this is a kind of lapsus calami that occurs even today. The fact that Renier cited the *Panopea aldrovandi* is itself evidence that he was writing after the publication of the name, for the species was not formally christened until Ménard named it in January (or April) 1807. It seems to me that this is good reason to date Renier's Tavole as 1807, posterior to Ménard's paper whatever the exact date of the latter proves to be.

Second are the innovations: *Marginelligenus, Marginella, Cystigenus, Cystia, Imisigenus, Imisia, Scolixedion, Arenarigenus, Arenaria, Planospirigenus,* and *Planospira* "Fauj." *Marginella,* proposed for a pelecypod, is not only a homonym

[4] There is a problem connected with the exact date and spelling of this name. According to Dall (Proc. Malac. Soc. London, vol. 10, no. 1, pp. 34–35, 1912), the name first appeared in print as *Panope* in January, 1807 in a privately printed 37-page pamphlet issued by Ménard to record a paper he had given a month previously at a meeting in Paris. Condensations of this booklet were later printed in Ann. Mus. Hist. Nat., vol. 9, pp. 131–139, in April, 1807, where the name was spelled *Panopea.* A second condensation appeared in Jour. Physique in August, 1807, with the spelling *Panope.* Sherborn (1929, pt. 19, p. 4731) does not mention the January publication, gives no evidence that he had studied Dall's testimony on the subject, and dates the name from April, 1807, as *Panopea.* The matter needs further study.

but a nomen nudum as well, and hence *Marginelligenus* falls with it. *Imisia* and *Imisigenus* also are without indication, based on an undescribed species. For *Cystia* and *Cystigenus* two species are listed, a point which both Sherborn and Iredale seem to have overlooked; hence, they are not nomina nuda. *Ostrea bullata* Born is now allocated to *Lima*, subgenus *Limatula*, and thus *Cystia*, if not also *Cystigenus*, is a prior name for the group of *Limatula* Wood, 1839. *Arenaria* is preoccupied. *Scolixedion* would be a nomen nudum as of the Tavole but it was validated in 1804 in the "Prospetto . . . Vermi," for Renier not only described the soft parts (clumsily and not too accurately, it is true) but also said, "Questo mio nuovo genere . . . viene costituito fin ora dal solo animale che abita e che forma la *Serpula arenaria* di Linneo." *Arenarigenus* would fall as a synonym, but *Scolixedion* antedates *Serpulorbis* Sassi, 1827, unless *Serpula arenaria* Linné is a *species dubium*. Neave records no *Planospira* of Faujas; perhaps this is a lapsus for *Planospirites*, for there is a *Planospirites ostracina* Lamarck in Protozoa.

This leaves *Fistulanigenus*, *Fistulana*, and *Hirundigenus*. *Fistulana* Lamarck being a homonym, *Fistulanigenus* might replace it save that *Chaena* Retzius, 1788, is available (type by subsequent designation of Gray, 1847, *Gastrochaena mumia* Spengler, a prior name for the *Fistulana clava* Lamarck). This is fortunate, as Renier confused *F. clava* Lamarck with *Teredo clava* Gmelin, member of a different family.

Pursuing now the second alternative, the implausible one that the names in Renier's first column are not emendations but are validly proposed and are to be based upon the species cited, not upon the type species of the earlier names—a course which is at variance with principles suggested by the International Commission of Zoological Nomenclature (1950, pp. 147–148)—the following would have to be considered:

In the event Guettard's names are suppressed as non-binomial, the first available synonym for *Uperotus* Guettard, 1770, a genus allocated to Teredinidae by Lamy (1927, p. 275), would be *Fistulanigenus*, based on *Teredo clava* Gmelin.

If by rigid interpretation *Crassatella* Lamarck is made a synonym of *Mactra* (the sole species cited being *M. cygnea*),

Crassatelligenus, based on *Crassatella gibba* Lamarck, would be the next substitute. It would antedate *Crassatellites* Krüger, 1823, which is a nomen nudum.

Gryphaeigenus would be available for designation as type of the fossil group of *Gryphaea arcuata* if the International Commission approves a petition now before it to make *G. angulata,* a Recent species, type of *Gryphaea.*

A few other available names might be detected by diligent search, but the task seems futile to me,[5] for I do not agree that these names ending in *-genus* are either validly proposed or valid emendations. I have merely outlined the consequences of such views.

It seems to me there is a significant difference between Renier's scheme and that of Poli. Poli proposed, for several genera that he recognized as new, two sets of names, one for the animal, the other, ending in *-derma,* for the shell. Simple priority, under Article 27a of the International Code, disposes of the synonymous members of these pairs of names. Renier, on the other hand, listed all or most of the established generic names of his day and suggested a means of reference to soft parts by the distinctive termination *-genus.* As he reversed Poli's procedure, his synonymous names are not so easily dealt with if regarded as scientific names, and line priority would favor the *-genus* members of synonymous pairs. In Opinion 72 of the International Code, there is ground for dismissing all of the names ending in *-genus* as being neither new names nor emendations but merely formulae for indicating that one is talking about soft parts. As formulae they are not names in the systematic sense and may be disregarded without the necessity of formal action. As I think I have shown, none of these names would serve a useful purpose if adopted. A few would displace familiar names, and all are etymologically objectionable. Jettisoning them by this device would save future systematists the need of citation, which alone would be a useful economy of time and printing space.

[5] Reproduction of the tables here, though desirable, is impossible, due to the poor quality and great reduction of the photographic prints. Persons in the United States interested in studying the work may consult the Stanford University copy through inter-library loan.

Renier's contributions to molluscan taxonomy, then, can be reduced to four generic names only one of which, *Aglaja*, is in current use. Two, *Scolixedion* and *Cystia*, will displace familiar names unless suppressed by action of the International Commission or unless it can be shown that their type species are species dubia. The fourth, *Discoides*, remains for specialists in Opisthobranchiata to evaluate.

Acknowledgments.—I wish to thank Drs. G. D. Hanna, Leo G. Hertlein, and Siemon W. Muller, who read the first draft of this paper and offered helpful criticisms and suggestions.

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KEY TO THE NASSARIIDAE OF THE WEST COAST OF NORTH AMERICA

By JOAN DEMOND

This key includes all species of *Nassarius* found on the west coast of North America from Cape San Lucas, Lower California, to Cape Flattery, Washington. It was devised after careful study of collections at the California Academy of Sciences in Golden Gate Park, San Francisco, at Stanford University, and at both the Los Angeles and Berkeley campuses of the University of California. Remnants of the Josiah Keep col-

lection at Mills College were also consulted. The key is based entirely upon external shell characteristics of adult specimens.

The author hopes the key will prove a workable aid to west coast conchologists.

A. Orange callus spreading over body whorl..... ..... *Nassarius fossatus*
AA. Orange callus absent.....B
B. Height of shell greater than width of body whorl.....C
BB. Height of shell approximately equal to width of body whorl..... *N. corpulentus*
C. Distinct groove over dorsum of anterior canal.....D
CC. Distinct groove over dorsum of anterior canal absent.... ..... *N. obsoletus*
D. Narrow shelf just at sutures.....E
DD. Shelf at sutures absent.....F
E. Raised ribs formed by axial lines present within aperture; shell sturdy; maximum height, 26 mm.....*N. perpinguis*
EE. Raised ribs within aperture usually absent; shell thin; maximum height, 37 mm.....*N. californianus*
F. Callus spreading at least slightly over body whorl.....G
FF. Callus definitely delimited, not spreading over body whorl.....I
G. Transverse sculpture of definite nodes.....H
GG. Transverse sculpture of ribs which do not form definite nodes.....*N. cerritensis*
H. Shell white or with brown spiral bands on body whorl; approximately 13 mm. tall.....*N. tegulus tiarulus*
HH. Shell dark brown or purplish, without color bands; approximately 18 mm. tall.....*N. tegulus*
I. Outer lip sharp and thin; shell slender and elongate....J
II. Outer lip swollen; shell not slender and elongate.....K
J. Nodes prominent on body whorl.....*N. mendicus cooperi*
JJ. Nodes absent or poorly developed on body whorl..... ..... *N. mendicus*
K. Canal relatively long and curved; shell 18 to 27 mm. tall; whorls angular.....*N. pagodus*
KK. Canal short; whorls not angular L
L. Transverse sculpture prominent on all whorls.....M

LL. Transverse sculpture prominent only on upper whorls; dominant sculpture of numerous extremely faint spiral lines encircling all whorls.....*N. insculptus*
M. Transverse sculpture forming nodes on body whorl; axial sculpture of impressed lines.....*N. versicolor*
MM. Transverse sculpture not forming nodes on any whorls; axial sculpture of raised lines.....*N. catallus*

NOMENCLATURAL NOTES ON THE SCAPHOPODA: THE SUBGENUS DENTALE DA COSTA [1]

By WILLIAM K. EMERSON [2]

During the preparation of a manuscript pertaining to the genera and subgenera referable to the molluscan class Scaphopoda, an obscure supraspecific unit, evidently overlooked by previous authors, was discovered. The genus *Dentale* was proposed by Da Costa (1778: 24) in his *Historia Naturalis Testaceorum Britanniae* with *Dentale vulgare* Da Costa, 1778, as the sole species. *Dentale* thus antedates by many years *Antalis,* 1846, which is generally used for the species comprising the *Dentalium entalis* Linné-*Dentalium vulgare* (Da Costa) group. This group is usually considered to be a subgenus of *Dentalium sensu lato* in which the species possess weakly developed longitudinal striae that tend to disappear in senescent stages, and often have a V-shaped apical notch on the concave face. In this subgenus the sculpture is developed to a much less degree than in *Dentalium sensu stricto.*

Since this subgenus presents a rather complex nomenclatural history which has led to considerable confusion, the synonymy pertaining to the group is outlined below. Each unit proposed for the group is discussed in chronological order.

Nomenclatural history.—While *Antalis* is generally ascribed to H. and A. Adams (1854: 457), Herrmannsen (1846: 63) appears to be the first author to have made valid use of the genus.

[1] Contribution no. 65 of the Allan Hancock Foundation, The University of Southern California.

[2] Research Fellow, the Allan Hancock Foundation.

He allocated no species to the genus, but provided a brief diagnosis, "*Tubulorum genus a Dentaliis notis levissimis distinctum,*" which apparently validates the name. H. and A. Adams (1854:457) assigned sixteen species, including *Dentalium entalis* Linné, to the genus without designating a type species. Pilsbry and Sharp (1897:37) designated *Dentalium entalis* Linné, 1758 as the type species of *Antalis* H. and A. Adams, 1854. The name *Antalis* was taken by Herrmannsen and the Adams brothers from the pre-Linnean usage of Aldrovandus (1606) and many subsequent authors.

Gray (1847:158) includes *Entalis* in his list of genera, referring to the type species as, "*Dentalium e.* Desh. 1825." Deshayes' monograph contains two species having the first letter of the trivial name commencing withe the letter e, *Dentalium elephantinum* Linné and *Dentalium entalis* Linné. Since Gray (1847) designated the former species the genotype of *Dentalium* Linné, it is logical to conclude that *Dentalium entalis* Linné is the species Gray (1847:158) indicated as *Dentalium e,* Deshayes, 1825 (= *Dentalium entalis* Linné, 1758). The genus *Entalis* was first validly used by Sowerby (1839) with reference to annelid worms, and is, therefore, not available for the scaphopods. Agassiz (1846:33) lists *Entalis* Gray as first appearing in the *Synopsis of the Contents of the British Museum* (1840). While this reference is not available to the writer, "*Entalis* Gray, 1840," provided it was validly proposed, is a homonym of *Entalis* Sowerby, 1839.

Newton and Harris (1894:66) proposed *Entaliopsis* as a new name for *Entalis* Gray, 1847, not Sowerby, 1839, with *Dentalium entalis* Linné, 1758, as type.

Antale "Aldrovandus" was used by Sacco (1896:97) for a number of fossil forms, including *Antale vulgare* (Da Costa) which he designated as the genotype a year later (1897:98). Several subsequent authors, including Rovereto (1900:201) and Cossmann and Peyrot (1917:4), have followed Sacco in this usage.

Entalis Gray, 1847 and *Entaliopsis* Newton and Harris, 1894 are thus junior objective synonyms of *Antalis* Herrmannsen, 1846, while *Antale* Sacco, 1896 is a junior objective synonym of *Dentale* Da Costa, 1778.

Synonymy in summary

Genus *Dentalium* Linné, 1758

Type species: (by subsequent designation, Montfort, 1810, p. 23) *Dentalium elephantinum* Linné, 1758, p. 785.

Subgenus *Dentale* Da Costa, 1778

Type species: (by monotypy) *Dentale vulgare* Da Costa, 1778, p. 24.

1778. *Dentale* Da Costa, Hist. Nat. Test. Brit., p. 24.
1846. *Antalis* Herrmannsen, Indicis Generum Malacozoorum, vol. 1, p. 63; type: (by subsequent designation, Pilsbry & Sharp, 1897, p. 37) *Dentalium entalis* Linné, 1758, p. 785.
1847. *Entalis* Gray, Proc. Zool. Soc. London for 1847, p. 158; type: (by original designation) "*Dentalium e*[*ntalis*] Desh. [ayes] 1825," p. 359 = *Dentalium entalis* Linné, 1758, p. 785. Not *Entalis* Sowerby, 1839, p. 42 (Annelida, Serpulidae).
1894. *Entaliopsis* Newton & Harris, Proc. Malac. Soc. London, vol. 1 (2), p. 66; type (by original designation) *Dentalium entalis* Linné, 1767, p. 1263 = *Dentalium entalis* Linné, 1758, p. 785.
1896. *Antale* Sacco, Boll. Musei Zool. Anat. Com. R. Univ. Torino, vol. 11, p. 97; type: (by subsequent designation, Sacco, 1897, p. 98) *Antale vulgare* (Da Costa), 1778, p. 24.

Acknowledgments.—The writer is indebted to Dr. Harold A. Rehder, Curator of Mollusks, United States National Museum, for checking an inaccessible reference, and to the administration of the Allan Hancock Foundation for material aid.

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THE LIMACIDAE AND PHILOMYCIDAE OF PITTSYLVANIA COUNTY, VIRGINIA

By LESLIE HUBRICHT

The present paper is the second installment on the land snails of Pittsylvania County, Virginia. The first on the Polygyridae, was published in *The Nautilus,* vol. 64, no. 1, July 1950. Other groups will be treated later as they become better understood.

Limax maximus Linnaeus. This species is abundant in all urban areas throughout the county. Occasionally it is found in the woods, where it attains a much larger size than in the towns.

Limax flavus Linnaeus. Known only from two specimens found in Gretna.

Limax marginatus Müller. Common in gardens and waste ground in Danville and Gretna.

Deroceras reticulatum (Müller). Found occasionally in Danville and Gretna .

Deroceras laeve (Müller). Common in all urban areas, along roadsides, and in clearings and meadows throughout the county. I have never seen a specimen in deep woods.

Milax gagates (Draparnaud). Common in Danville.

Philomycus carolinianus carolinianus (Bose). A common species in the flood plains of the Dan, Roanoke, and Banister Rivers.

PHILOMYCUS CAROLINIANUS COLLINUS, **new subspecies.**

Differs from typical *P. carolinianus* in reaching a somewhat larger size, in being browner, and in being without the two rows of black spots. The color pattern consisting of a broad dorsal band and a narrower latteral band on each side and scattered, irregular, small spots between.

Type Locality: upland oak woods, 7.5 miles east of Wilkesboro, Wilkes Co., North Carolina. Holotype A.N.S.P. no. 187431, paratypes A9966, collection of the author.

Figure 405-f, page 757, H. A. Pilsbry, Land Mollusca of North America, vol. II, is apparently of this subspecies.

Typical *P. carolinianus* is the form of the flood-plain woods, while *collinus* is the upland form. It is the common *Philomycus* of the Piedmont. Although not common in the mountains, it has been found at an altitude of 4000 feet at Mountain Lake, Giles Co., Virginia. It is common in upland woods throughout Pittsylvania County.

Philomycus flexuolaris (Raf.). In Pittsylvania County this species is found only on the bluffs along the Roanoke River from the Smith Mountain Gorge to Altavista. This is a mountain

species occurring abundantly in western Virginia. It is not found in the Piedmont proper, and I have not seen specimens from west of the mountains.

P. flexuolaris was treated as a subspecies of *P. carolinianus* by H. A. Pilsbry (Land Mollusca of North America, Vol. II, p. 786) but I believe it to be distinct as it differs in its color pattern, in its anatomy, and its physiology. It frequently shows a distinct oblique color pattern which is rare in *carolinianus,* and the pigment spots are usually larger, and do not have the sharp outlines usually found in *carolinianus. P. flexuolaris* and *P. c. collinus* occur together in many places in western Virginia and there is no intergradation. Not only is the dart sac smaller in *flexuolaris* than in *carolinianus,* as noted by Pilsbry, but the entire genitalia is distinctly smaller. While experimenting with chlorotone for killing slugs, I tried too strong a solution on a mixed lot. The *collinus* were not harmed but the *flexuolaris* were ruined.

Pallifera mutabilis Hubricht. A common species in upland oak woods, and along river bluffs.

Pallifera dorsalis (Binney). Generally distributed over the county, but not abundant.

Pallifera secreta (Cockerell). Known only from two specimens collected in a ravine near the Dan River, west of Schoolfield.

P. secreta is also known from a ravine, near Kibler Park, below Pinnacles Power House, Patrick Co.; bluff opposite Radford, Pulaski Co., Virginia; and ravine, Hanging Rock State Park, Stokes Co., North Carolina.

Pallifera fosteri F. C. Baker. A common species of upland oak woods. It is the common *Pallifera* over the Piedmont and Coastal Plain, occurring as far north as Washington, D. C., south into Georgia, and east to Norfolk, Virginia, and Washington, North Carolina. I have not seen it in the mountains.

P. fosteri becomes mature in late fall and early winter and lays its eggs under logs in January and February. The eggs are adhesive, in elongated clusters of fifteen to thirty eggs, yellow, and surrounded by three membranes.

ARNOLD EDWARD ORTMANN AS REVEALED BY HIS LETTERS—II

By HENRY VAN DER SCHALIE

Another instance of how keenly Ortmann used facts he gathered is in a letter to Walker, dated Oct. 23, 1913. He mentioned that the topography of the Powell drainage in Campbell County, Tennessee, is peculiar and that the features there indicate a possible connection with New River (a tributary to the Cumberland). He then states:

"It may be that Powell River, even the Clinch, once passed through this gap and to the Cumberland, *below the falls,* and thus might have been *one* of the routes by which upper Tennessee fauna reached the Cumberland."

Again in a letter to Walker dated Sept. 28, 1915:

"Although most species are all over the upper Tennessee drainage, there are quite a number which are restricted to certain parts only. This seems to indicate to me that the upper Tennessee drainage of the present time has been formed by the union of originally distinct systems. Remarkably enough, the same facts turn up in the distribution of certain species of river-crayfishes."

Ortmann was aware of the limitations in zoögeographical work. His desire to marshal substantial data before suggesting an explanation perhaps accounts for his willingness to share his ideas in correspondence with others rather than risk publishing them without substantial evidence. In a letter to Calvin Goodrich (Mar. 22, 1920), he discussed at length certain stream connections which might account for certain distributional patterns observed by Goodrich and subscribed to by Ortmann. Then he makes this significant statement:

"One thing is clear: when we begin to study the development of the fauna of a river-system, *our knowledge of the distributional facts must be complete.* There must be no large areas, like the uppermost Black-Warrior basin, of which we do not know anything. H. H. Smith has done wonderful work in the Alabama-drainage, but his work has not been completed—so much more in his untimely death to be regretted."

A few days later in another letter (Mar. 26, 1920) to Goodrich, he wrote:

"This much is sure that the history of the Cumberland, Tennessee, and Alabama drainages, and the history of their faunas is extremely interesting, but also quite complex. But the first thing to be done is to get complete records of the distributional facts."

And pursuing the same basic ideas, he wrote (Dec. 3, 1920):

"Now, it is all-important that these views should be tested in other groups of fresh-water life. If your studies on the Anculosae can furnish any data which bear upon this they will be very important, and no matter what your *conclusions* are, the establishment of the *distributional facts* and the affinities of the forms concerned will be of lasting value. Thus I would encourage you to go ahead: you *may* make mistakes in the interpretation of the facts (just as I *may* have made mistakes in the above sketch of the history of the Naiad-fauna) but these can be corrected and the various facts reconciled when more studies of this sort, in other groups, have been made. But a beginning should be made."

An indication of how prepossessed he was with the implications of the zoögeographical facts he and his colleagues were gathering is found in the following quotations taken from letters to Calvin Goodrich: On Nov. 6, 1923, he was concerned about the peculiar way the lower Tennessee runs northward when he wrote:

"I am all the time pondering over the question of the former Tennessee drainage. There is hardly any doubt that once it must have gone into the Mississippi Embayment (Upper Cretaceous). The Tennessee may have developed its present course in the same way as, for instance, the Delaware between Pennsylvania and New Jersey, between Trenton and Philadelphia, running parallel to the shore-line. This is explained by the presence of softer and harder rocks, running in *belts* parallel to the shore (in a "belted Coastal Plain"). But this is, so far, only the "general idea": particulars can only be found out by a close study of the local conditions."

And a week later (Nov. 14, 1923) he wrote:

"This is only a very general sketch, and there were additional changes of drainage. The headwaters of the Tennessee (above Knoxville) originally belonged to the Upper Cumberland, but

were deflected (in Tertiary) southwestwards to the Hiwassee-Tennessee (the Hiwassee is the old head of Tennessee, from Chattanooga downward). But apparently there were other changes upon the *Plateau,* in Caney Fork, Duck River, and Elk River drainages, complicating matters. I hope to be able to tackle this question in the future (and this also involves the relations to the upper Coosa and Upper Black Warrior which do not exist!). It is a fascinating study; and I hope I shall not go crazy over it: I am getting quite nervous over it at times, and am dreaming at night about rivers and plateaus, and drainage lines, without being able to find a solution."

As is evident from the foregoing account of his interest in zoögeography, Ortmann's studies were more apt to be profound than shallow. He was well aware that he tended to stay close to certain groups in his quest for facts and there are perhaps those who might conclude that he ignored other groups of mollusks. The following quotations show that he quite definitely saw essential phases of the biology of the pleurocerids although he left the details for others to work out. In a letter to Goodrich dated Oct. 25, 1920, he wrote as follows:

"I have to answer yet your letter of the 12th of this month in which you suggest that I might take up the study of the *Pleuroceridae.*

"I have been thinking of this myself, and have repeatedly made attempts in the past at least to identify the species collected by myself, and have had rather indifferent and unsatisfactory results. I was unable to devote considerable time to this, and after I had come into communication with Hinkley, I turned my material over to him for identification. This concerns chiefly our Pennsylvania forms, and those collected in East Tennessee (of which I have a *very* large number)."

Later in a letter dated Oct. 31, 1923, he wrote to Goodrich as follows:

"I am very interested in what you say about the grading of forms of Pleuroceridae of the upper streams into those of the lower. You remember I have similar instances among the Naiades, and Walker also, in the beginning, did not want to believe this. I feel rather sure that a similar phenomenon exists in *Lithasia geniculata-fuliginosa:* my finds *in the field* immediately suggested this to me, and remember, Adams has shown long ago that this is also the case in *Io,* and I have been able to confirm this. *So I am much in favor of your idea."*

In concluding, I would like to indicate briefly that Ortmann had a good sense of humor. In a letter to Walker (June 24, 1913) he tells about his trip to Tennessee with Goodrich:

"Goodrich has collected many snails on our trip. . . . On our first collecting day (Sunday, May 11, at Cedar Bluff) we were arrested for 'fishing on Sunday,' but had the laugh finally on the Chief of Police, because he could not prove that we were 'fishing.' Goodrich intends to write a story of our trip, and I hope he will bring out this incident.[1] We shall send a copy to the chief of police, who apparently took us for very dangerous fellows, inquiring whether we were armed, etc."

On July 6, 1913, Ortmann, who was in the field in Bristol, Virginia, wrote a letter to Walker telling about his field experiences. At the end of the letter he appended the following ditty:

"All things come to him who waits
But I know a rule that's slicker,
The man who goes after what he wants
Will get it all the quicker."

and as a postscript he added:

"It's *awfully* hot here; but I had a fine swim in the Holston after I was through with the shells."

A DISTORSIO NEW TO THE FLORIDA FAUNA

By AXEL A. OLSSON and THOMAS L. McGINTY

On Easter Sunday, March 25th, the senior author accompanied the McGintys on the motorship *Triton*, on a dredging expedition off Palm Beach. Among the many treasures obtained on that fine day, is a *Distorsio* new to the Florida fauna. Other specimens of this same species had been dredged by the McGintys on former occasions, so the shell is not rare. Previously, the only living *Distorsio* known from West Atlantic waters is the larger, smoothly rounded and evenly cancellated *D. clathrata* of Lamarck.

Dall in the *Blake* report mentioned two forms of *Distorsio* in the West Indian-Caribbean region, for which he used the names

[1] Goodrich wrote about this incident in *Nautilus*, 27: 81.

clathrata and *reticulata*. His "*clathrata*" is clearly the species described herein as *constricta floridana,* a Panama-Pacific stock; his second species called "*reticulata*" is the true *clathrata* of Lamarck. The type illustration of *D. clathrata*, upon which its identification must be based, is that of Bruguière in the Encyclopédie Méthodique, vol. 2, pl. 413, fig. 4. This is the simple-corded *Distorsio* obtained commonly by shrimp fishermen at Key West. Young specimens are shown in our Plate 1, figs. 10, 11, 12. It is the usual shallow-water species found at Lake Worth and other localities along the Florida coast. In life it has a thin, straw-colored epidermis, closely adherent, with a single, large bristle arising from each node of intersection of axials and spirals. Its protoconch is relatively large, turbinate, of about 5 convex, smooth whorls of a brown or honey color. When perfectly fresh the protoconch has a thin epidermis, usually forming a small crown, but this is soon lost (see fig. 12). *Distorsio reticulata* of Link and Röding is an Indo-Pacific species, based on Martini's figure in the Conch. Cabinet, vol. 2, figs. 405, 406; in the text these figures are named *Cassis vera, Distorsio reticulata, alba*, and the locality is specifically given as Küste von Hitoe. There are excellent specimens of this species in the Academy's collection from the Philippines.

The new form, herein designated subspecies *floridana,* is related to the Panama-Pacific group of *D. constricta* Broderip, a fairly common shell along the Ecuadorian coast northward to Panama. This group is represented in the Miocene of Bowden, Jamaica and Santo Domingo, where it is generally called *D. constricta simillima* Sowerby. Allowing for some variation common to all distorsios, the apparent differences between the Florida shell and the living Pacific *constricta* appears slight indeed, the principal ones being its constantly smaller size and somewhat longer, more slender anterior canal. In the latter character the recent Florida shell is closer to the fossil *simillima,* so much so that, were it not for their marked difference in size, they might well be united under the same name.

DISTORSIO CONSTRICTA FLORIDANA, new subspecies. Plate 1, figs. 5, 6, 9.

Shell relatively small, the type having a length of about 27 mm., another specimen measures height about 31 mm. Nucleus

is bulimoid, relatively large, of 2 smooth whorls, with the change to the sculptured nepionic whorls abrupt. On the earliest post-nuclear whorls the sculpture is formed by 3 simple spiral cords, evenly spaced, and crossed by vertical axials enclosing deep, square pits, the resulting pattern being a coarse reticulation. There are small apertural varices scattered along the spire-whorls indicating resting intervals, and on the fifth post-nuclear whorl it begins to assume the sharply humped form of the adult shell. As the same time, and as the diameter of the whorls continue to enlarge, the upper two primary spirals spread apart and smaller secondary and tertiary spiral threads appear in the spaces between them. The body-whorl is sharply angled on the back, the crest of the hump crossed by a double or triple cord. Aperture partly filled by tooth-like projections from the outer lip, the middle tooth largest. Anterior canal of medium length, slender, bent backwards and upwards. Color in life is yellow to brown, with a heavy, closely adherent epidermis, setose, the individual hairs on the nodes shorter and less conspicuous. Protoconch smaller than in *clathrata*. Radula (fig. 9) taenioglossate, small, about 2½ times smaller than that of *clathrata*, the central tooth with a width of 28μ. Central tooth wide, with a large middle cusp and 4 or more smaller cusps on the sides. Lateral large, shaped like a lizard's jaw with a large cusp in front, often a smaller one below, and with 10 or more small cusps or serrations in line on the upper side. Uncini, two at each end, are long, curved and pointed.

Type: Length 27.8 mm., diameter 15.5 mm.

Paratype; Length 30.8 mm., diameter 15.3 mm.

Locality: Off Palm Beach, Florida, 30 to 40 fathoms. Type and paratype 187684 ANSP.

HAROLD HEATH, 1868–1951

On April 22, 1951, malacology lost another of its distinguished devotees. Dr. Heath, as he was known to a host of students and friends, passed away at his home in Pacific Grove, California after a long illness. He left behind his wife Mrs. Elsie Shelly Heath, two sons, Ronald and James, and a daughter Mrs. Phyllis Heath Walker.

Dr. Heath was born June 5, 1868, in Vevay, Indiana. He graduated from Ohio Wesleyan University and then obtained Master's and Doctor of Philosophy degrees from the University

of Pennsylvania, the latter in 1898. After teaching biology at Ohio Wesleyan for two years and at College of the Pacific for one year he went to Stanford University in 1894 as instructor in zoology. In 1909 he became full professor, a position which he retained until retirement in 1933. For 15 years he acted as Scientific Director of the Pacific Grove Museum, a small but outstandingly well organized institution.

He was primarily a fundamental zoologist and therefore at an early date took up studies which he hoped would lead to a better knowledge of the origin and development of Mollusca. This necessarily required anatomical and embryological research of the most refined technique. He became a master in the reconstruction of involved anatomy from serial sections and the drawings he made, sometimes with pencil, sometimes with pen, are rarely equalled in scientific literature. He thought a study of some of the lower groups of animals would give a clue as to the origin of mollusks and the thesis for his Doctor's degree was entitled "The Development of Ischnochiton." (Zool. Jahrb. Abt. Morph., vol. 12, pp. 567–656, test figs. A–D, pls. 31–35, 1899.)

It was his interest in morphology that led to studies in Solenogastres, culminating in the monograph of the group, "The Solenogastres" (Mem. Mus. Comp. Zool. Harvard College, vol. 15, 1911, pp. 1–179, pls. 1–40).

The last of such laborious projects which was completed is the great work on "The Anatomy of the Pelecypod Family Arcidae" (Trans. American Phil. Soc., new ser., vol. 31, pt. 5, Aug. 1941, pp. 287–319, pls. 1–22).

Dr. Heath preferred to leave the description of new species to others; therefore, he was probably not so well known to the rank and file of collectors as he might have been. Many species have been named for him, however, and at least two genera bear his name: *Heathilla* Hannibal (a freshwater Pliocene fossil) and *Heathia* Thiele (a chiton).

His interests in natural history were broad. In 1903, 1904 and 1906 he was a naturalist aboard the U.S.S. *Albatross* in Alaska, along the California coast and in Japan. In 1911 he went to Brazil as a member of the Branner expedition and while there he made a very large collection of reptiles and amphibians. During the summer of 1910 and again in 1915 and 1917 he was

on the Pribilof Islands in Bering Sea making studies of the fur seals. It was my good fortune to be with him during the latter two summers and I learned more zoology then than in all of the courses I took in college. The faculty which he had to a superlative degree of inspiring enthusiasm among his students, I later learned, was well known to all of his associates.

Few of those who knew Dr. Heath will ever forget his hearty good humor and his masterful technique.

G. D. Hanna

FRANK MACE MACFARLAND, 1869–1951

On February 21, 1951, Dr. MacFarland died very suddenly while approaching the entrance of the California Academy of Sciences, San Francisco, where he expected to attend the annual meeting. He had been closely associated with this institution for many years, having served on the Council from 1926 to 1932, first vice-president, 1932 to 1934, and president for 12 years, 1934 to 1946. He also acted as director from 1934 to 1938 and had been made an honorary member.

He was born in Centralia, Illinois, June 10, 1869. His undergraduate work was done at De Pauw University where he received a Ph.B. degree in 1889. From 1889 to 1892 he taught biology and geology at Olivet College, Michigan and in June 1892 he went to Stanford University as an advanced student and instructor. This institution became his home for the remainder of his life. He received an A.M. degree in 1893 but chose to do the remainder of his graduate work in Europe. During his stay there he studied at the Marine Station at Naples and at the Universities of Zürich and Würzburg. At the latter he was granted a Ph.D. degree.

At Stanford Dr. MacFarland was officially professor of histology and he was a master in that difficult branch of biology. He engaged in many other activities on the campus, one of the most important having been his service on the Committee on Admissions to the Medical School. Students and associates alike respected him most for his remarkable aptitude in teaching, his cordiality and his broad knowledge of world-wide scientific literature.

Systematic malacologists will miss him greatly because he worked all of his academic life on a group which few persons have chosen to study and fewer still have understood, namely the Opisthobranchiata, including those marvelously beautiful tide pool animals, the nudibranchs. Some of his better known papers on this subject are cited at the end of this obituary.

Dr. MacFarland was very exacting in his studies of these organisms and in many cases he thoroughly investigated anatomical details and histology as well as external features. Much energy had been devoted to the preparation of a monograph of the group as it is represented in west American waters, together with a bibliography to cover the literature of the world. It is very unfortunate that he failed to see the work completed. I have seen some of the manuscript and the incomparable illustrations prepared by his wife, Olive Hornbrook MacFarland, who has assisted him throughout his career. Few if any west American mollusks have been so completely studied as are many of those treated in this manuscript. It probably will be prepared for publication and if so it should rank along with the great monograph by Alder and Hancock which appeared nearly a century ago. It will be a fitting monument to a sincere and devoted man.

List of Titles on Mollusca

1897. Celluläre Studien an Mollusken-Eiern. Zool. Jahrb. Anat., vol. 10, pp. 227–264, 5 pls.
1905. A preliminary account of the Doridiidae of Monterey Bay, California. Proc. Biol. Soc. Washington, vol. 18, pp. 35–54.
1906. Opisthobranchiate Mollusca from Monterey Bay, California, and vicinity. U. S. Bureau Fisheries, Bull., vol. 25, pp. 109–151, pls. 18–31.
1909. The Opisthobranchiate Mollusca of the Branner-Agassiz expedition to Brazil. Leland Stanford Junior University Publ. Univ., Ser. No. 2, pp. 1–104, pls. 1–19.
1912. The nudibranch family Dironidae. Zool. Jahrb., Suppl., vol. 15, pt. 1, pp. 515–536, 3 pls.
1923. The morphology of the nudibranch genus *Hancockia*. Journ. Morph., vol. 38, pp. 65–92, pls. 1–6.
1924. Expedition of the Calif. Acad. Sci. to the Gulf of Calif. in 1921. Opisthobranchiate Mollusca. Proc. Calif. Acad. Sci., ser. 4, vol. 13, pp. 389–420, pls. 10–12.

1925. The Acauthodorididae of the California coast. Nautilus, vol. 39, pp. 49–65, 94–103, pls. 1, 2.
1929. (Co-author with C. H. O'Donohue.) A new species of Corambe from the Pacific Coast of North America. Proc. Calif. Acad. Sci., ser. 4, vol. 18, pp. 1–26, pls. 1–3.
1929. *Drepania.* A genus of nudibranchiate mollusks new to California. Proc. Calif. Acad. Sci., ser. 4, vol. 18, pp. 485–496, pl. 35.
1931. *Drepanida,* new name for *Drepania* Lafont, preoccupied. Nautilus, vol. 45, pp. 31–32.

G. D. Hanna

NOTES AND NEWS

Dates of the Nautilus.—Vol. 64, no. 1, pp. 1–36, pls. 1 and 2, was mailed July 5, 1950. No. 2, 37–72, pls. 3 and 4, and frontispiece, October 27, 1950. No. 3, pp. 73–108, pls. 5 and 6, Feb. 15, 1951. No. 4, pp. 109–144, i–vii, pls. 7 to 10, May 7, 1951.—H. B. B.

A Rectification of Some Central American Unionidae.—At the time of publication of our paper "A Clarification of Some Central American Unionidae described by R. A. Philippi" (1951, Nautilus, **64**, pp. 77–83), I was unaware of Dr. Fritz Haas' earlier publication "Uber nord- und mittelamerikanische Najaden" (1930, Senckenbergiana, **12**, p. 317–330) which modifies some of my previous conclusions. Haas selected a lectotype for *Anodonta nicaraguae* Philippi (p. 322, fig. 1); hence the specimen I selected and figured must be considered a paratype. Haas regards the species as a variety of *Anodontites trapesialis* Lamarck.

Haas also selected lectotypes for *Anodonta cornea* Philippi (p. 321, fig. 3) and *Anodonta atrovirens* Philippi (p. 321, fig. 2) and includes them both under Lea's earlier name, *Anodonta montezuma* (1841, Proc. American Phil. Soc., **2**, p. 31; 1842, Obs., **3**, p. 78, pl. 22, fig. 55) (Central America). The type is presumably in the American Museum of Natural History in New York City, being based on a single specimen from the J. C. Jay Collection. All three of Haas' lectotypes are in the Museum of Rouen, France.

Also in my previous paper "Morlet" should read in all instances *Morelet*.—Richard I. Johnson.

Eastern Pacific Poromya and Cetoconcha Names.—Apparently it has not been noticed by recent workers that Ridewood in 1903 inadvertently described two new species of *Cetoconcha* in his "On the structure of the gills of the Lamellibranchiate" (Philos. Trans. Royal Soc. London, series B, vol. 195, pp. 147–284). Both were described as *Poromya* and in each case figures were given of the characteristic gills and other internal organs. One of these is *Poromya oregonensis* (no locality given). I can find no subsequent mention of this name in the literature, including the Zoological Record, and because no shell characters are given, it probably should be considered a *nomen dubium*. I mention this so that an unnecessary homonym may be avoided in the future. It is possibly one of the species which Dall named later. *Cetoconcha smithi,* later described by Dall in 1908, is mentioned in name only.

The first species, discussed and figured by Ridewood on p. 272, appears to be sufficiently described, and the evidence strongly points towards its being *Cetoconcha malespinae* Dall, 1916. Ridewood says, "Professor Dall was good enough to send, among other material, a well-preserved specimen of *Poromya*, dredged from 1569 fathoms in the North Pacific, broad off the harbour of Sitka, Alaska [same data given by Dall in 1916]. It is an undescribed species, but Professor Dall tells me he intends to describe it under the name *Poromya malespinae.*" It would be best, then, to refer to this species as *Cetoconcha malespinae* Ridewood, 1903. The alternative, which does not seem to be the wiser choice, is to consider *malespinae* Ridewood a different species, or an unrecognizable one. This, however, would make Dall's 1916 *malespinae* a homonym and in need of a new name. —R. Tucker Abbott.

Antalis "Herrmannsen."—Dr. Emerson on p. 18 is in error in stating that Herrmannsen "provided a brief diagnosis" of "*Antalis* Auctt. Aldrov. 1606." Herrmannsen merely remarked (in Latin, quoted by Emerson) that it is "a genus of tubule shells distinguished from the Dentalia by very slight characters," none of which are mentioned. He gave references to various non-binomial works in which Antalis was mentioned,

but cited no specific name. By Opinion 5, a pre-Linnean name does not become eligible by simply being cited by a post-Linnean author. There is no evidence that Herrmannsen adopted or accepted the few pre-Linnean names he listed, and it is quite absurd to quote his remark as a "diagnosis," or to give him as authority for *Antalis*. In the synonymy on p. 19 Dr. Emerson quotes me (Man. Conch., 17: 37) as designating a type for "*Antalis* Herrmannsen." This is not the case; I gave a type for *Antalis* H. & A. Adams. I mentioned Herrmannsen, but regarded *Antalis* as pre-Linnean as listed by him.—Pilsbry.

Drymaeus multilineatus eboreus, new form.—The shell is opaque ivory yellow with white apex and few to numerous unevenly spaced obliquely axial streaks of light chestnut on the last two whorls, absent on earlier ones. Length 22.8 mm., width 10.3 mm. Plate 2, fig. 6.

A pure colony at northeast end of Little Pine Key, Monroe County, Florida.

This race differs from *D. multilineatus* and from the variety *latizonatus* by absence of the dark madder blue color of the early whorls. Spiral peripheral and sutural bands are wanting, the blackish area around the columella is also absent in *eboreus,* which is free from exaggerated markings. No examples at all intergrading have been found.—C. N. Grimshawe.

Discus rotundatus (Müller) in New York.—Mr. Roger Bretet of the New York Shell Club recently found this European snail in Ft. Tryon Park. The park lies near the western tip of Manhattan Island between West 193d and Dyckman Streets. On June 1 the writer visited the locality in the company of Mr. Bretet and noted the following data regarding it. The location of this colony, which includes an area of only about 15 feet by 8 feet, lies about 75 feet north of the south pedestrian entrance from Riverside Drive. Further land marks are a flight of stone stairs about 20 feet to the south of the site and a huge elevated terrace a few hundred feet to the north. The colony lives in very wet leaves to the right of the foot walk, at the base of a steep rocky slope. The leaves are kept wet by a persistent ground seepage and the presence of a small brook nearby. The colony lives in a very limited area, since no signs of the snails were found anywhere else in the immediate vicinity. This fact

may indicate a very recent introduction. Within the area, however, the snails are fairly abundant on very wet, but not drowned, leaves. We collected a round dozen in a very few minutes and saw signs of many more. The specimens are quite typical in appearance, being however generally somewhat smaller and decidedly more depressed than shells from Maastrich, Holland (L. Venmans) and Hohenaschau, Bavaria (H. Friedrich). Specimens are in the collection of Mr. Bretet and the writer.

The snails were associated with *Oxychilus cellarius* (Müller), *Arion circumscripta* Johnston (both immigrants) and *Deroceras laeve* (Müller). Elsewhere in the park Mr. Bretet found *Cionella lubrica* (Müller). The absence of such common native species as *Zonitoides arboreus* is noteworthy.

Although this is the first record of this snail in New York, and one of the most notable finds in the area in recent years, *D. rotundatus* has been reported from Ferryland, Newfoundland, and Dorchester and Woods Hole, Massachusetts. (Pilsbry, Land Molluscs of North America, 2: 617). The occurrence in Ft. Tryon Park bears out Dr. Pilsbry's statement that "the sporadic and urban localization of the colonies indicates accidental introduction."—Morris K. Jacobson.

New localities for Eumelus (Philomycidae).—Recent fieldwork has yielded (summer 1949) living specimens of *Eumelus lividus* Rafinesque from water-retaining holes in Basswood trees (*Tilia* sp.) on the southeastern bank of Big Bureau Creek, about 2 miles northeast of Princeton, Bureau Co., Illinois. Also on July 16, 1949, living specimens were taken by Virginia Pumphrey and the author at Fox Ridge State Park, Coles Co., Illinois; the specimens were secured from the brick retaining wall behind the research laboratory, and from small wooden bridges about the general area. In addition, a single specimen of *Eumelus wetherbyi wetherbyi* (W. G. Binney) was taken June 14, 1950 from a nut-sized hole in a boulder amid rock outcrops on a hillside about 3 miles east-northeast of Cowan, Franklin Co., Tennessee, on route US 41A and US 64. This subspecies has not heretofore been recorded from other than Kentucky. Glenn R. Webb, Ohio, Illinois.

PUBLICATIONS RECEIVED

THE PELECYPODA OR BIVALVE MOLLUSKS OF PORTO RICO AND THE VIRGIN ISLANDS. By Richard A. McLean (Vol. 17, pt. 1 of Scientific Survey of Porto Rico and the Virgin Islands, New York Acad. Sci., 1951, 183 pp., 26 plates).—In this manual the species are all briefly described and all are figured. The genera, families and higher divisions are defined and there is an interesting though brief discussion of the general classification of bivalves. Convenient keys are provided to genera and species.

This handbook will be most useful to all interested in the bivalves of Florida and the West Indies, as it includes most of the generally distributed littoral species of these seas, providing in one cover much information otherwise difficult of access to many interested in our shell fauna.—H. A. P.

NEW RECORDS FOR THE DISTRIBUTION OF LAND MOLLUSKS IN NOVA SCOTIA. By Muriel J. Ord and Anne H. G. Watts. Proc. Nova Scotian Institute of Science, 22: 16–34.—Of the five slugs studied only one had been recorded previously. This report contains descriptions of each species, with figures of the living animals and their internal anatomy, notes on their laying periods and eggs, and such characteristics of their habits as were observed in the field and in captivity.—H. A. P.

SHELL COLLECTOR'S HANDBOOK. By A. Hyatt Verrill. G. P. Putnam's Sons, New York, 1950.—Mr. Verrill does not claim that his book is "an erudite scientific treatise on sea shells," and suffice it to say, it is not. The book contains more inaccuracies and misconceptions than are easily excused. For example, the author confuses the anterior with the posterior of the clam; expresses doubt as to whether pteropods are bivalves or univalves; and has an astonishing idea as to the function of the pallet in shipworms.

The author discusses the romance and thrills of shell collecting with charming enthusiasm, and this should prove inspirational to neophite conchologists; but it is to be hoped that in the future Mr. Verrill will leave the scientific aspects of malacology to men who are experts in the science, or else learn to differentiate the anterior from the posterior, and that the pallets of a *Teredo*—the plumber's friend—cannot be used as a saw.—RICHARD I. JOHNSON.

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DREDGING FROM THE CRUISER TRITON

By ARTHUR R. THOMPSON, PAUL L. AND THOMAS L. McGINTY

Regarding deep sea dredging as a private venture, little descriptive material concerning mechanized method appears to have crept into molluscan literature since the days of J. B. Henderson and his yacht *Eolis,* so it has occurred to the writers that a brief account of our project, together with a few observations, might prove of interest at this time.

The dredging team of Thompson and McGinty had its inception in the spring of 1949, when the senior author commissioned the two juniors to purchase and fit out a vessel suitable for exploration in adjacent Florida waters. The selection of a boat best suited for this type of work proved more difficult than anticipated, but finally the choice became a Chris-Craft cruiser slightly over 30 feet long, which, thanks to the wisdom of our skipper, was powered by two Chrysler marine engines. Her cabin held sleeping accommodations for four, also galley and toilet room with running water, plus a cleverly arranged combination of table and built-in seats to afford comfortable eating space, while the cockpit, flush decked, was sufficiently roomy to permit a workable arrangement of the dredging gear. Lois, our first mate (Mrs. Thompson), appropriately chose the name *Triton,* it being not only a well known shell, but also the name of a mythological character, the son of Neptune, who possessed the pleasant faculty of calming the seas by the simple expedient of blowing upon his conch-shell trumpet.

The actual installation of the dredging gear proved to be a rather complicated technical problem requiring considerable forethought and planning; but briefly, its nucleus consisted of a 7000-foot capacity 1/8-inch steel cable, U. S. Army Type tow target winch. This device, although intended for sleeve target control in aircraft gunnery practice, is excellent for dredging purposes

following certain alterations. It was thought advisable to convert the original 24-volt electrical system to gasoline power, using a Briggs & Stratton motor with 6 to 1 reduction gear, and 4 to 5 horsepower size. A small cone type marine clutch was coupled to the drive shaft to actuate the winch through double grooved pulleys holding heavy "V" type belts, these affording an additional reduction of about 5 to 1, due to the difference in pulley sizes. Handles to the clutch and winch brake assembly were so arranged as to be conveniently accessible to a single operator, while the cable indicator, a worm gear device showing cable on or off the drum, was mounted overhead and clearly visible to both winch and boat operators. The cable in our installation was fed from the winch, which has a built-in level winder, over two sturdy case-hardened horizontal rollers and between two verticals, the iron frame holding the rollers extending beyond the stern sufficiently to permit the dredge, in coming up, to clear the boat by about two feet. Since the strain at this point would be considerable, reinforcings were put into the interior of the boat as a precautionary measure. Next, a swinging davit with three-fall block and tackle was installed at the stern to aid in hoisting the heavy dredge on board. The completed unit, mounted on an iron plate and permanently secured in the after part of the *Triton* cockpit, occupied an area slightly less than 3 by 4 feet, and presented a rather neat and efficient appearance.

Working in the strong current of the Gulf Stream things can happen quickly, and often do, so a number of safety measures were incorporated into the mechanism. Steel cable under high tension is potentially dangerous, so a mesh guard was placed above the cable feed in the hope of preventing a snap back into the cockpit should the cable part. Actually, it has broken several times but has not yet shown this dangerous tendency. In addition, a sharp ax is kept handy in case the dredge fouls on bottom and following seas pile over the stern. Fortunately, it has not yet been necessary to cut the cable, but we dislike dredging in following seas because of this hazard. Another precaution was the placing of a wire netting guard over the belt and pulley drive to prevent the accidental entry of fingers or clothing into this dangerous area. In the event of power failure to the winch, a

hand crank was provided, but thankfully, we have not yet been obliged to bring it into action.

Perhaps the simplest way to explain the mechanical function of the installation would be to describe the procedure followed in making a typical haul, so, for convenience, let us assume that the skipper is holding the *Triton* on a predetermined course towards a likely dredging area, while the crew is busily engaged in setting up the gear. The canvas cover over the winch installation is first removed, and it in turn snaps into fasteners across the stern seat to form an apron upon which the dredge contents may be dumped. Over this, in one corner of the seat, is placed a large wash-tub of sea water into which fit screens of varying mesh for the sorting of specimens from the mud and rubble brought up by the dredge. Grease cups over bearings are checked and filled if necessary; the davit is swung overboard and made ready for use, and then comes the attachment of the sounding lead. This is done by using a swivel and screw shackle, an arrangement which permits rapid change from sounder to dredge, or from one dredge to another.

Having arrived at the dredging area, bearings are checked with shore, the vessel brought into dredging position with the current off the stern, and the heavy sounder is lowered to give a depth reading directly on the winch indicator. The little motor is then cranked up, and quickly brings in the sounder from which a sample of the bottom is obtained and the proper choice of dredges is decided upon. This factor is best learned from experience, but we might say that for use over rocks or coral a heavy metal dredge is safest, while over soft mud some form of net trawl may at times be used to best advantage.

With the dredge lowered away, something more than twice the depth is released on the cable, the boat moving slowly forward during the lowering process to prevent snarls or kinks from forming due to slack in the line. The exact amount of cable needed, and the speed of the boat in towing must be learned by experience, for the current and wind are such variable factors that no certain rules may be followed. If the current is strong it is often necessary to use considerably more cable, while the forward speed of the vessel, in dredging, may vary from slow speed ahead, to drifting without power, or even on occasions to

running both motors in reverse in an attempt to keep the dredge moving at an optimum slow speed over the bottom. It is advisable to maintain contact with the dredge at all times by resting one's hand on the taut cable and noting the telegraphed impulses transmitted up the line while the dredge is in motion, the object being to keep the dredge in action, but with speed slow enough to prevent lifting off bottom. Art has perfected this technique to a point where he interprets these jerks and tugs into types of bottom with such accuracy that he almost predicts the kinds of shells entering the dredge at the moment! Besides this duty, he keeps busy sorting the dredged material, and between the two jobs finds little idle time. Paul serves as log-keeper, navigator and helmsman, while Tom, who does something of everything, acts as winch engineer, dredge lifter and dumper, and keeps busy sacking up the small material which is a residue of the preliminary or coarse screening done as the dredge comes in. Each haul is given a number on the daily dredging sheet together with data covering depth, type of bottom, location, etc. This sacked small material, with individual station numbers is then taken home to be dried, rescreened, and further examined.

When a check with the log shows that the dredge has been down a sufficient time, the winch motor is again cranked up and the lifting operation begins. At this point team-work between crew members and skill in handling the gear play an important part. With a strong current or wind abeam, the boat may tend to shift position, no longer permitting the cable to feed straight over the stern rollers to afford minimum friction and wear on the cable. This is corrected by kicking the boat back into position, if necessary one motor placed in reverse, the other ahead. Should the dredge foul on bottom, it is generally best to back up on both motors attempting to bring the boat to a point almost over the dredge, where it will usually free itself. In strong current the dredge acts as a stern anchor, making it almost impossible to turn the boat for a run back as would seem most practical, so, at best, some losses in gear must be expected. In making the lift, strain is reduced if the boat is backed slowly until the dredge just clears bottom, then slow speed forward may be used to protect the cable from possible contact with spinning propellors.

As the reading on the depth indicator approaches zero, one member of the crew takes station at the stern, and by a system of visual signals, necessary because of the noise made by the three roaring motors, warns the winch-man of the dredge's approach in an attempt to make the stop just as the dredge chains reach the outer roller, thus facilitating the hooking on of the block and tackle, suspended from the davit, which is used for hauling the load inboard. This accomplished, the dredge is then carefully lowered and its contents gently dumped upon the canvas apron, while all gather eagerly around to see what rare treasures and beauties the sea has disclosed. Each succeeding haul presents new thrills which can only be compared to childhood joys on a Christmas morning.

After bringing up the dredge nearly a thousand times, we feel well pleased with the installation, for with its simplicity and reliability it has certainly lived up to all possible expectations.

The cable in use, while not stainless steel, is supposedly rust resisting and has proved quite durable. As a precaution against excessive rusting, however, each layer on the drum is liberally coated with engine oil during the process of bringing up the last load of the day. An oil trap, with provisions for dumping, effectively prevents excess oil from coating the deck to make for hazardous footing. Surprisingly, with care it has been possible to keep the *Triton* quite neat and clean, for most of the trash and dirt is contained in the canvas apron across the stern, and little makes its way into the bilge. The clean-up process, something of a chore, usually starts on the long run in, to be finished at the dock where gear and decks are flushed with fresh water and the finishing touches administered with a mop.

For ease of operation and reasonable safety, a minimum boat size of about 30 feet seems indicated for this type of work. Anything less, in our opinion, is somewhat risky, especially off the Keys, where dredging is often done well beyond sight of land. A twin screw boat, because of its extra motor and additional safety factor, plus superior maneuverability, offers definite advantages in this type of operation.

The results of the *Triton* dredging, so far, have been most fascinating and gratifying. The major portion of our work has been concentrated between 20 and 150 fathoms, a territory

less thoroughly worked by the larger expeditions, and about which it was hoped we might add some useful information to the present knowledge of undersea life. Many strange things have come to light, some rarities, a number of possible new species, and perhaps even a few new genera. Among the choicer things have been the following: of Volutidae, *dohrni, dubia, florida, gouldiana* and *schmitti*; of Conidae, *amphiurgus, mazei* and *stimpsoni*; of Pectinidae, *glyptus, phrygium* and *tereinus;* while of Muricidae, one of our best finds has been *Murex beaui.* Unfortunately, the operation of dredging has kept us quite occupied, leaving little time for a proper study or correlation of our findings which must come at a later date. However, accurate data are being furnished each dredged lot with particular effort being made towards alcoholic preservation of new or unknown mollusks.

After handling a considerable quantity of material, in some instances fairly large series of similar specimens, we are convinced that entirely too much significance has been attached by many students to such variable factors as color, length of spire, width of aperture, etc. In some instances even the principal type character appears most infrequently upon examination of a sizable series. Dogmatic statements certainly tread on dangerous ground, for so much remains to be learned about many of these deep sea creatures.

We have observed that depth appears to be a quite positive controlling factor for a number of species, particularly some *Conus* and *Murex,* while other mollusks apparently cover a much wider depth range without difficulty. When off range, however, there is a tendency towards divergence in size. It is of interest to note that a number of forms assume a reddish or orange coloration when living at a depth of about 20 to 40 fathoms. As might be expected, the color on most shells has a marked tendency to diminish as the greater depths are reached.

In conclusion, the writers wish to give thanks to many friends who have helped towards the success of our venture. Particular thanks are due to Henry Brunhoff, who assisted in the search for the proper vessel and designed a superior type of vertical roller; to J. W. Donovan, who has been a valuable crew member on many dredging trips, both off Palm Beach and outside the Florida

Keys; and last, but far from least, the junior authors wish to express their gratitude to A. R. Thompson, *Triton*'s owner and skipper, who has afforded them the great pleasure of being associated with him in a most fascinating and worthwhile program of research.

A PECULIAR GENUS OF VITRINELLIDAE

By H. A. PILSBRY and A. A. OLSSON

Among minute shells collected in Ecuador by the junior author was found a curious snail related to *Teinostoma* but which we think represents a new genus.

Woodringilla, new genus

The minute, rather solid shell is similar to *Teinostoma* s. lat., but with conspicuous spiral sculpture; and the heavy umbilical callus is deeply engraved with parallel grooves at right angles with its anterior edge. Type *W. glyptylus* n. sp.

The thick, deeply grooved umbilical callus is probably an unique feature of this genus. It is such an unusual character that we are considering it of generic significance, although the structure otherwise agrees with the more compact species of *Teinostoma*.

The degree to which the last whorl embraces and envelops the spire is variable in *Woodringilla,* as it is among the species of *Teinostoma*.

The type species, *W. glyptylus* (Pl. 3, figs. 2, 2a), measures, diameter 1 mm., height 0.6 mm. It will be described fully in a paper now waiting publication.

A species of this group was described from the Bowden, Jamaica, Miocene as *Teinostoma laccus* by Dr. W. P. Woodring, 1928.

NEW SPECIES OF EPITONIIDAE AND VITRINELLIDAE FROM PANAMA CITY

By AXEL A. OLSSON and MAXWELL SMITH

The following four new species were collected by Mr. Walter D. Clark of Bostick, Florida at Venado, Panama City, Panama. Venado is a suburb in the eastern part of Panama City. It faces a stretch of shore fronting Panama City harbor, formed by shelving layers of volcanic rocks of Tertiary age flanked by short intervals of beach. At its extreme eastern point it merges into a mangrove swamp. Harbor pollution and various restrictions affecting the Canal have greatly limited the opportunities for shore collecting in the vicinity of Panama City, Venado Beach being one of the few places remaining accessible to transient visitors.

Epitonium chalceum, new species. Plate 3, fig. 3.

Shell rather large, the type nearly 23 millimeters in length, elongate, slender, composed of numerous rounded whorls sculptured with a neat pattern of small, thread-like varices and finer spiral threads. The type has 10 whorls, the minute whorls of the nucleus being missing. There is no basal disk, the spiral threads on the base being only a little more crowded together. Varices about 26, generally low, thread or cord-like, rounded, some a little heavier indicating a resting mark, their course oblique across the face of the whorl, their ends touching or alternating at the suture. On the main surface of the whorl as between the sutures, the primary spirals are spaced widely and evenly apart (about 18 above the base), the intervening space between them and the varices subrectangular in form and marked by 4 or 5 much smaller threads, minutely reticulated by the fine growth-lines producing a linen-like, textured pattern. Aperture, broken in the type specimen, is subcircular, the outer lip thickened only by the last varix and ending forward in a slightly appressed shallow canal. Inner lip is bordered externally by a thickened cord which is formed by the united ends of the varices reflexed backward. Length 23.7 mm., diameter 7 mm.

This is a fine species distinguished by its relatively large size and elegant sculpture somewhat similar to that shown by *Ferminoscala* but much finer and without a basal disk. A closely similar species, still undescribed, occurs at Manta, Ecuador, but

the whorls are narrower, more convex and the varices and spiral sculpture is heavier. The single specimen representing the figured type was collected at Venado beach, Panama City by Mr. Clark. Holotype in the private collection of Mr. Maxwell Smith.

Dentiscala clarki, new species. Plate 3, fig. 4.

Shell of medium size, solid, imperforate, white or yellowish with a chalky texture. Spire stout, formed of 7 or more whorls, uniformly enlarging and terminating in a small, blunt nucleus of about 2 whorls. Varices 10 to 13, strong, of irregular size and number, continuous across the face of the whorl from the base to the suture which they may emarginate more or less strongly, their trend along the length of the spire nearly straight. Intervarical surface smooth except for minute spiral lines visible only under a microscope on clean, unweathered surface. Length 12.2 mm., diameter 4 mm. Type. Length 11.88., diameter 4.1 mm. Paratype.

Two specimens are available of this species. There is no indication of a basal disk.

Distribution: Venado Beach, Panama City, collected by Mr. Clark. Type 187201 ANSP.

Clathrus venado, new species. Plate 3, fig. 5.

Shell of medium size, turbinate, white, of about 9 whorls, the apical 2 being very small and smooth belong to the nucleus. Whorls convex, the coiling moderately close, the surface of the whorls not quite touching each other. No basal cord or disk. Varices 13, relatively thin, erect, of medium height, their edges entire when perfect, rounded or bearing an indistinct low spine at their shoulder point. Forward face of each varix is smooth or faintly roughened, the inner face concave, smooth. Intervarical surfaces with weak spirals which show as widely spaced raised threads, about 6 on the last whorl; these intervarical spirals being best developed in the middle zone, above the band bordering the suture to about the third and the base is smooth. Varices join together in the umbilical area to form a pillar cord. Aperture obliquely subovate, the peristome formed in part by the forward face of the last varix, flattened, flaring out slightly in front to form a shallow anterior canal. Length 9.9 mm., diameter 5 mm.

This species is close to Dall's unfigured *Epitonium zeteki*,[1] described from Panama, but is larger, narrower, has 13 instead

[1] Dall, 1917. Proc. U. S. Nat. Mus., vol. 53, no. 2217, p. 486.

of 11 varices; the spiral threads on the intervarical surface are well spaced, while they were said to be close-set in Dall's species.

Distribution. One specimen collected by Mr. Walter D. Clark of Bostick, Florida, at Venado Beach, Panama City. Type 187200 ANSP.

CYCLOSTREMISCUS MAJOR, new species. Plate 3, figs. 1, 1a, 1b.

The shell is relatively large for the genus, subsolid, with a semi-nacreous luster, the spire low but projecting visibly above the dorsal profile, and with a wide, open umbilicus which extends deep into the apical whorls as a small perforation. Whorls about 5, the first turn belonging to a very small, minute, glassy nucleus. Sutures indistinct, the coiling of the whorls following one of the principal spiral cords which it overlaps except on the extreme final portion where the suture is descending. Sculpture is formed by smooth, spiral cords which lie ridge-like between wide, smooth, concave interspaces of variable width. The penultimate whorl has 5 spirals; on the body-whorl there are 9 on the dorsal surface between the suture and the periphery; 6 on the upper half of the ventral surface; 4 on the umbilical side. Umbilical wall funnel shape, smooth or obscurely spiralled. Aperture obliquely subcircular, the lip thin and somewhat sinuated, with a small posterior sinus above slightly removed from the suture and opposite to it on the basal lip a small, sharp notch. Greater diameter 10.5 mm., height 5.3 mm.

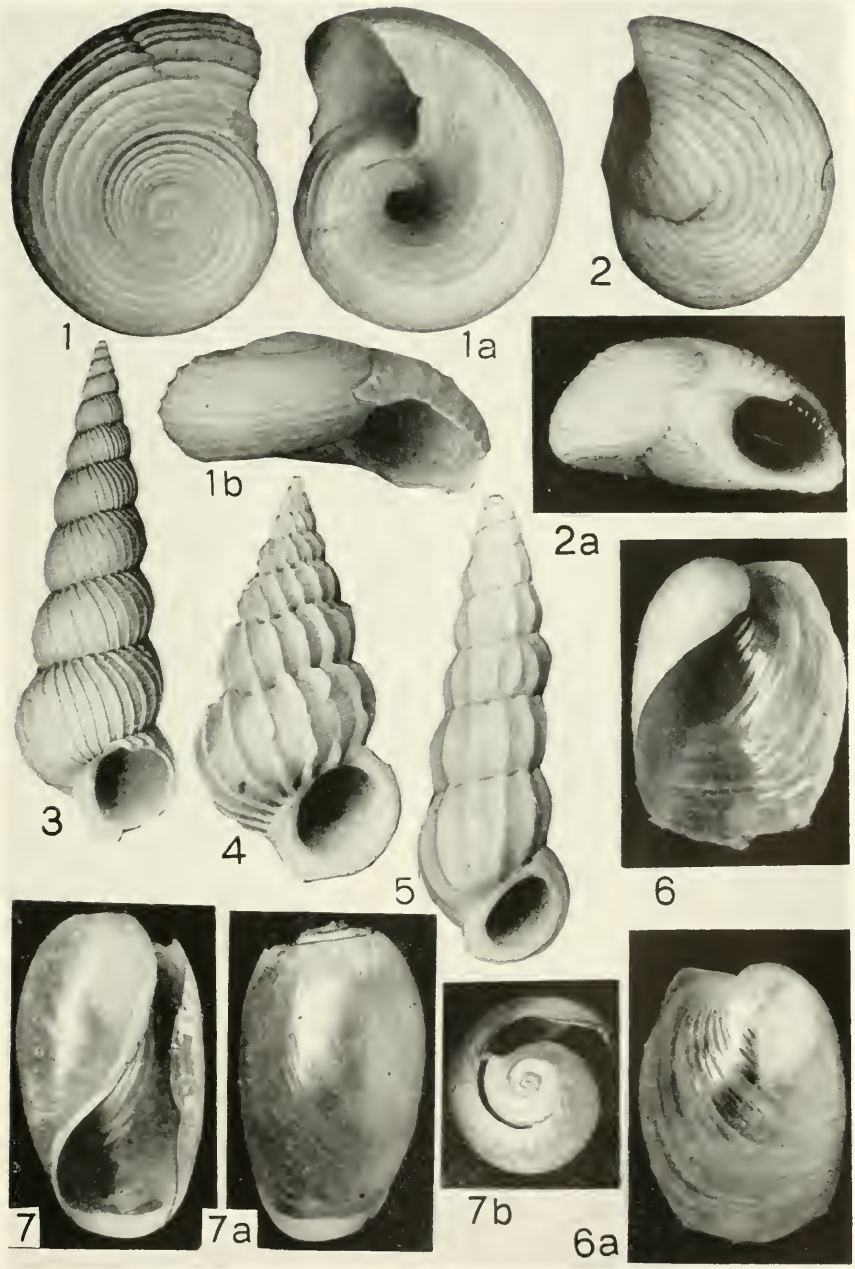
We are referring this species to *Cyclostremicus* tentatively but the true position of this form as well as many other similar Vitrinellidae must await knowledge of the soft parts, operculum and radula.

A single specimen was collected by Mr. Clark at Venado Beach, Panama City. Type 187199 ANSP.

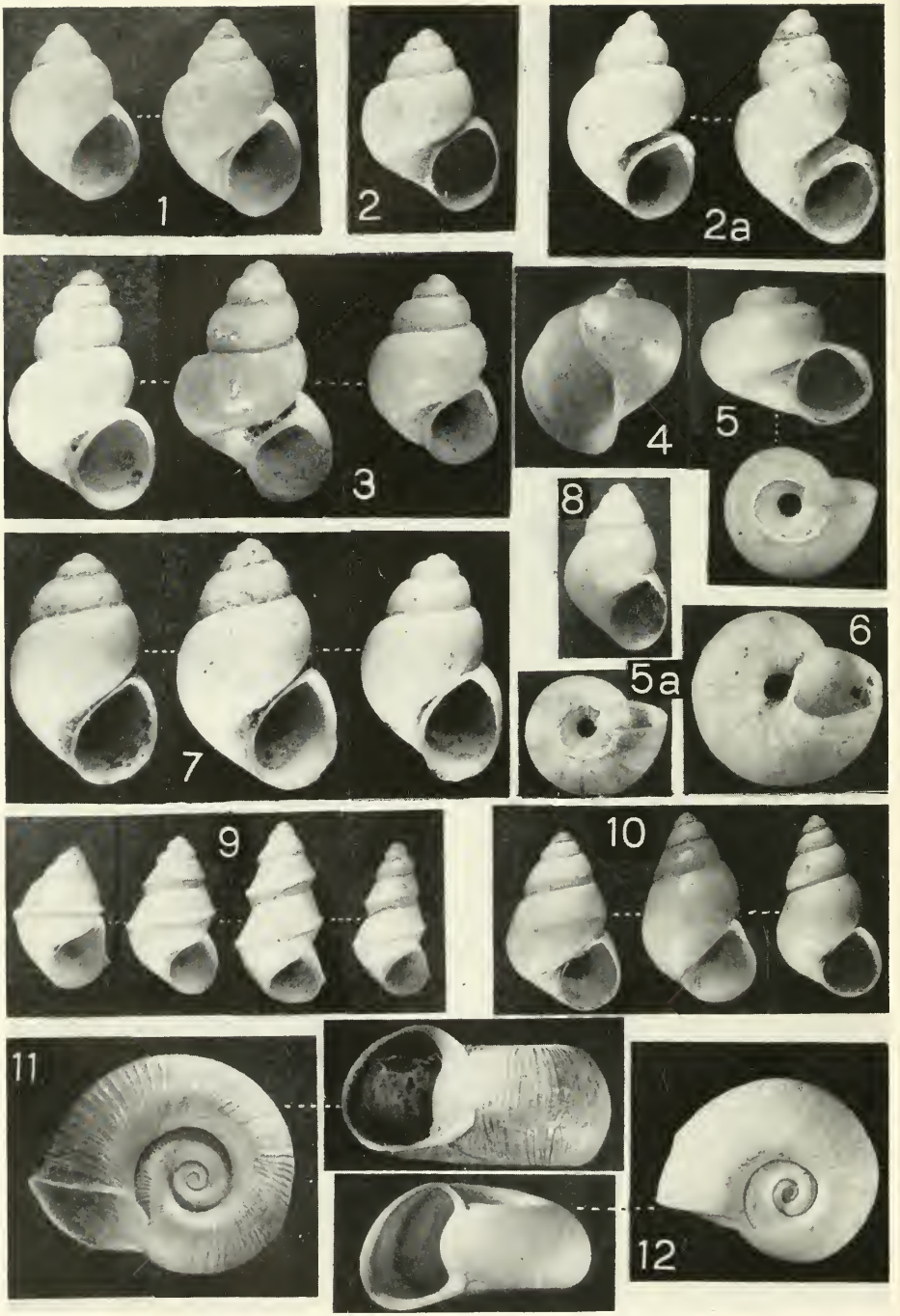
FURTHER OBSERVATIONS ON THE MOLLUSCA OF THE RELICT LAKES IN THE GREAT BASIN

BY JOSHUA L. BAILY, JR. AND RUTH INGERSOLL BAILY

In the summer of 1949 the authors visited some of the relict lakes in the Great Basin for the purpose of observing at first hand the evidence of Pleistocene lacustration and to gather some of the semi-fossil mollusca for which this region is noted. A



1—1b, Cyclostremiscus major O. & S. 2, 2a, Woodringilla glyptylus P. & O. 3, Epitonium chalcenm O. & S. 4, Dentiscala clarki O. & S. 5, Clathrus venado O. & S. 6, 6a, Philine infundibulum Dall. 7—7b, Akera thompsoni Olsson & McGinty.



J. L. & R. I. Baily: Mollusks of the Great Basin.

preliminary account of our peregrinations has been published (Baily, 1950) in which no attempt was made to assign names below generic rank to any of the material taken.

Subsequent experience has confirmed the wisdom of this course, as in many cases different species and subspecies are so closely related and consequently resemble each other so closely that their discrimination requires a technique of precision and a knowledge of detail that was not available to us in our own laboratory.

Therefore when the way opened for us to spend a month in Philadelphia after an absence of twelve years we packed up the spoils of our expedition and brought them along in order to take advantage of the facilities offered by the Academy of Natural Sciences. In our state of innocence we supposed that all we would need to do would be to bring our samples into one-to-one correspondence with those in the collection of the Academy and to assign names to our own accordingly, but a few hours of effort convinced us that our task was one of far greater complexity than we had envisaged. In many instances we did not have sufficient individuals to make identification certain beyond all possibility of reasonable doubt, and in a few instances our material seemed to represent forms new to science. Consequently we were obliged to call upon Dr. Pilsbry for assistance, and he responded nobly to the task of unravelling the many Gordian

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EXPLANATION OF PLATE 4

1. *Amnicola integra* (Say). Humboldt Sink, Nevada.
2. *Amnicola integra* (Say). Bonneville Terrace, Great Salt Lake.
2a. Same as 2. Abnormal specimens. 27945 ANSP.
3. *Amnicola pilsbryi* sp. nov. Lifton, Idaho; left hand figure the type, 187691 ANSP.
4. *Physa lordi zomos* subsp. nov. Pyramid Lake. 187699 ANSP.
5. *Valvata utahensis horatii* subsp. nov. Lifton, Idaho; lower figure the type, 187689 ANSP.
5a. Same as 5. Ideal Beach, Utah.
6. *Valvata utahensis* Call, typical. Provo, Utah.
7. *Amnicola longinqua* (Gould). Colorado Desert.
8. *Amnicola* sp. inq. Toy, Nevada. 187692 ANSP.
9. *Pyrgulopsis nevadensis* (Stearns) s. s. Pyramid Lake. 156338.
10. *Pyrgulopsis nevadensis paiutica* var. nov. Pyramid Lake. 187673.
11. *Helisoma binneyi ursolacustre* subsp. nov. Lifton, Idaho. 187690.
12. *Helisoma tenue* (Dunker). Pyramid Lake.

knots with which the descriptive malacology of this region is so afflicted.

All told, fourteen localities were visited in the course of this investigation. That is hardly enough from which to draw final conclusions, but it constitutes a beginning and should encourage others to make additional contributions to our knowledge of Great Basin malacology. Three of these localities are on the shore of Bear Lake: Lifton, Idaho, at the north end; Ideal Beach, Utah, near the south end; and Lakota, Utah, near the middle of the west side. No collecting is possible on the east side, for here the beach is buried beneath the accumulated detritus left by the construction gang when the highway around the lake was built.

Bear Lake stands in the same relationship to Great Salt Lake that Lake Tahoe does to Pyramid Lake. But Bear Lake is shallow, with a simple shore line, and surrounded by relatively arid mountains with sparse vegetation, while Lake Tahoe is deep, with an indented shore line, and surrounded by coniferous forests. They resemble each other, however, in the paucity of their molluscan populations.

Until recently living mollusks had not been reported from Lake Tahoe (Hanna and Smith, 1938) or from Bear Lake (Henderson, 1931). Henderson believes that all those species whose shells are so numerous today on the sand beaches at each end of Bear Lake became extinct in the near geologic past as the result either of extreme salinity or of complete desiccation. However, near Lakota we have taken species of *Physa, Lymnaea, Promenetus,* and *Ferrissia* of such fresh appearance as to make us suspect that they may be still living in local restricted areas. We concede that *Carinifex newberryi, Valvata utahensis,* and *Sphaerium pilsbryanum* are probably no longer living in this lake.

The only point on the Great Salt Lake readily accessible by highway is at Saltair on the south shore, where the beach consists of a highly impacted mixture of salt and sand. The only easily reached points on Utah Lake are at Saratoga on the northwest, Geneva on the northeast, and Provo near the middle of the east side. Material was obtained from all these points.

Our road map showed an unimproved roadway leading south

from Toy, Nevada, along the margin of the lake in Humboldt Sink, but upon our arrival we found that the water level had risen and that the road was completely submerged. Near the point where it disappeared beneath the water we gathered a handful of shells from a windrow.

At Pyramid, Winnemucca, and Walker Lakes we found shells in the drift at only one point each. In each instance this was on the west side of the lake about halfway between the ends. As none of these points had local names by which they might be designated we have referred to them merely by the name of the lake, trusting the reader to remember that collecting was done at only one point on each lake. Similarly we gathered shells from Honey Lake at only one locality, near the hot springs at the northeast corner, and from Lake Tahoe only at the extreme southernmost point.

Topaz and Diaz lakes are not relict lakes, but as they are located near the Sierras on the western edge of the Great Basin it seems better to include than to omit them. Their faunas are not particularly interesting. With the completion of these preliminary descriptive remarks the separate consideration of the species and subspecies may now be taken up.

Anodonta nuttalliana Lea. Walker Lake. A few odd valves from the higher horizons. Possibly no longer living.

Sphaerium pilsbryanum Sterki. Lifton; Ideal Beach; Saratoga, Provo.

Pisidium compressum Prime. Lifton; Geneva; Provo; Toy. Specimens from Lifton have the stout lateral teeth and ridged beaks of *P. compressum,* but the half dozen single valves collected are all small, up to 3 mm. in length.

Pisidium occidentale Newcomb. Lifton; Ideal Beach; Lakota; Saratoga; Topaz Lake. A few specimens from Lifton and Saratoga are provisionally identified as half grown young of this species.

Valvata humeralis californica Pilsbry. Lifton; Ideal Beach; Saratoga; Provo; Toy. Most of these specimens have the spire higher than in the type lot of this subspecies, but there are some of intermediate shape.

Valvata utahensis Call s. s. Lifton; Provo. Plate 4, fig. 6, showing the absence of a basal carina.

Valvata utahensis horatii subsp. nov., Lifton; Ideal Beach. Plate 4, fig. 5, 5a. Holotype no. 187689 in the collection of the Academy of Natural Sciences, the lower specimen under fig. 5. In the original description of *Valvata utahensis* special emphasis was laid on the single well marked carina on the upper surface of the younger whorls, but no mention was made of the possibility of a basal carina, nor does the illustration afford any evidence of such. The specimen figured by Chamberlin and Jones (1929, p. 184, f. 86) also represents the body whorl as being carinate above but smooth beneath. We find this condition to be characteristic of shells from Utah Lake, the type locality of *Valvata utahensis*.

Valvata utahensis. Specimens from Bear Lake referred to this species by Henderson (1924, p. 193, and 1931, p. 109) exhibit a very different condition. In these there is a basal carina, which would justify segregation of the Bear Lake material as a separate species were it not for the fact that specimens lacking the basal carina are occasionally encountered in Bear Lake, together with intergrading individuals that form a continuous series effectually connecting the extreme forms on each side. The basally carinate forms seem sufficiently distinct to justify a subspecific name and accordingly we propose to call them *Valvata utahensis horatii*.

This new subspecies is named for Dr. Horace Burrington Baker in acknowledgment of his kindness in identifying the terrestrial mollusca taken on this expedition. These, of course, have nothing to do with the Pleistocene relict lakes and so constitute no part of this report.

Fluminicola fusca Haldeman. Lifton; Ideal Beach; Geneva; Provo. This is the only species of this genus which we observed in the Great Basin. However, Chamberlin and Jones (1929, p. 180) and Henderson (1924, pp. 191–2) recognize the possibility of another species of doubtful identity from the same general area.

Amnicola limosa Say. Geneva, Provo. Readily recognizable by its blunt apex.

Amnicola pilsbryi sp. nov., Lifton; Ideal Beach. Plate 4, fig. 3. Holotype no. 187691 in the collection of the Academy of

Natural Sciences, the left hand figure on the plate. The other two figures are paratypes selected to illustrate variation.

Several authors have reported *Amnicola longinqua* Gould from Bear Lake. We did not find specimens referable to that species, but the new species here described was present in great abundance.

This species is narrowly umbilicate, conic, smooth, with about four and a half very strongly convex whorls. The suture is deeply impressed. The aperture occupies about 40% of the length and is of a broadly oval shape, noticeably oblique. The columellar margin is slightly expanded. Length 3.0 mm., diameter 1.8 mm.

The abundance in which this species occurs in Bear Lake (it is the most numerous species found there) precludes any possibility of its being a newly discovered species. It is undoubtedly the species recorded by so many previous collectors as *Amnicola longinqua* Gould, a plentiful species in the Colorado Desert, which probably occurs in Utah although we did not find it there. In the new species the whorls are more inflated, and the columellar portion of the peristome tends to be more closely appressed to the body whorl.

The name herein given to this species is a very inadequate expression of gratitude for laborious and painstaking examination of this material. In deciding which of the forms taken in this investigation merited new names Dr. Pilsbry's advice was quite indispensable.

Amnicola (*Cincinnatia*) *integra* Say. Toy. In these specimens the whorls are notably less convex than in typical *Amnicola cincinnatiensis* (Anthony), as this species is more commonly known.

Associated with this species were two shells which we have not been able to identify with any yet described. The species which they most closely resemble is *Amnicola imitator* Pilsbry, but the habitat of that species is the Santa Cruz peninsula in California which is so remote as to make it seem very unlikely that it is conspecific.

In the new species the shoulder is much more sloping than in *Amnicola integra*. A single specimen numbered 187692 in the collection of the Academy of Natural Sciences is figured in Plate

4, fig. 8, and measures 3.4 mm. in height and 2.1 mm. in diameter, with four whorls. A detailed description with new name must be held in abeyance until more material becomes available.

Pyrgulopsis nevadensis Stearns s.s. Pyramid, Winnemucca, and Walker Lakes. This is the most plentiful mollusk in Pyramid Lake. Specimens were taken from the water's edge as well as from a bed which we estimate to be about fifty feet above the present water level. We also took it from the dry bed of Winnemucca Lake and the beach of Walker Lake. Further study is needed to determine whether any significant differences exist among the samples taken from these four localities. Berry (1947) suggests that the Winnemucca Lake form may prove specifically distinct from the type, and it is not impossible that other differences may be found to exist.

Four specimens from the collection of the Academy of Natural Sciences are figured in Plate 4 at fig. 9, for the purpose of illustrating the range of variation of this species, and for comparison with the new variety described below.

PYRGULOPSIS NEVADENSIS PAIUTICA subsp. nov., Pyramid Lake Plate 4, fig. 10. Holotype no. 187693 in the collection of the Academy of Natural Sciences, the right hand figure on the plate. The left hand figure is an intergrade between the new variety and the type.

Shell small, elongated, its total length from apex to base of body whorl being approximately twice the maximum diameter; surface vitreous and polished, generally white but sometime discolored and of slaty appearance. Whorls about five or six; peristome simple and rounded below; aperture angulated at suture, which is very slightly channelled. A slight umbilical chink sometimes present. Type locality, Pyramid Lake.

In the typical form of this variety there is no evidence whatever of the peripheral carina that characterizes this genus (Call and Pilsbry, 1886). If this condition were universal and discontinuous it would not be possible to retain this new variety in the genus. Occasionally, however, ambiguous individuals are encountered in which, although the carina is absent, it is represented by an inconspicuous peripheral angulation. In addition, there is in our collection a single specimen which began life as typical *Pyrgulopsis nevadensis* but in which the carina suddenly

became obsolete, apparently as the result of a pathologic or perhaps an ecological factor, leaving the snail to complete the last one and one-half whorls of its growth as *Pyrgulopsis nevadensis paiutica.*

The taxonomic value of this variety is somewhat problematical. It can hardly be considered a legitimate subspecies since its geographic habitat is coterminous with that of *Pygulopsis nevadensis* s.s. The fact that the intergrades are less numerous than the extremes on each side may indicate a genetic difference. Perhaps it would be better to regard *Pyrgulopsis nevadensis paiutica* as an incipient species which has achieved genetic differentiation but which has not yet lost its ability to hybridize with the ancestral form.

The name *paiutica* is given to commemorate the Paiute Indians on whose reservation this variety was found.

Lymnaea (*Radix*) *auricularia* Linnaeus. Topaz Lake. The occurrence of this European species in the Great Basin was quite a surprise. The specimens taken were all quite small, indicating either that they were juvenile or representatives of a stunted race.

Lymnaea (*Stagnicola*) *parva* Lea. Lifton; Saratoga; Geneva.

Lymnaea (*Stagnicola*) *palustris* Müller. Saltair; Geneva; Provo; Lakota.

Lymnaea (*Stagnicola*) *proxima buttoni* Baker. Geneva; Saratoga.

Lymnaea (*Stagnicola*) *hemphilli* Baker. Ideal Beach; Saratoga. The descriptions of the last two forms listed above were written by F. C. Baker (1934) under the names *Stagnicola palustris buttoni* and *Stagnicola hemphilli* respectively, from material supplied him by Henderson. Baker did not publish any illustrations as this had already been done by Henderson (1934, p. 124, pl. 14, f. 4, 7) to whose publication Baker made reference. Henderson in turn in his text credited both species to Baker, under the impression that the descriptions had already appeared.

(*To be continued*)

ARION INTERMEDIUS (NORMAND) NEAR BUFFALO, N. Y.

By MARGARET C. TESKEY

This small greyish-yellow slug, listed in Pilsbry's "Land Mollusks of North America" as native of Europe and occurring only in California, was collected at two stations in Erie County, New York, during the summer of 1950.

When first observed under chips and bark slabs in a thicket near the village of Lancaster, N. Y., it was mistaken for immature *Arion subfuscus* (Draparnaud), although no adult specimen of this species had been observed in the vicinity.

Later in the summer the same slug turned up in some abundance in a spot some eighteen miles removed from the first station. this time in a densely wooded hillside tract in the Boston Hills, seventeen miles south of Buffalo. Here in nearly every case the slugs were found in mould at the edges of rotting logs, although three specimens were obtained when loose bark was peeled from a beech stump, revealing as well several specimens of *Philomycus carolinianus flexuolaris* Rafinesque of unusually large size and brilliance of mottled pattern.

It was these larger slugs which led to the discovery of the identity of the European visitors, for they were sent to Charles B. Lee at Ann Arbor with a request for identification of the enclosed "sample." Mr. Lee at once recognized *Arion intermedius* (Normand) ; Dr. Aurele LaRocque later verified his identification.

Beech and maple trees predominate in the woods in which this find was made; in a remote section, it has been long neglected and the many rotting logs and stumps support an unusually varied and colorful assortment of fungi. Three specimens of *Triodopsis dentifera* (Binney), a rare snail in this region, were here taken on subsequent visits made for the purpose of securing additional specimens of *A. intermedius* for Mr. Lee. A third slug, *Pallifera dorsalis* (Binney), occurs here, but less frequently than the other two.

OLIVE SHELLS ON OPPOSITE SHORES OF THE GULF OF CALIFORNIA

By D. S. and E. W. GIFFORD

That veteran conchologist, the late Herbert N. Lowe, greatly extended knowledge of the molluscan fauna of the northern end of the Gulf of California through his collecting expeditions to two fishing villages on opposite shores of the Sea of Cortez. These villages are Puerto Peñasco, Sonora, and San Felipe, Baja California, about ninety miles apart in air line across the Gulf. Lowe's papers dealing with the former are entitled "On the Sonoran Side of the Gulf" [1] and "New Marine Mollusca from West Mexico, Together with a List of Shells Collected at Punta Peñasco, Sonora, Mexico." [2]The paper dealing with his trip to San Felipe is called "At the Head of the Gulf of California." [3]

For the Punta Peñasco region, Lowe lists six species of Olividae: *Agaronia testacea* Lam., *Olivella dama* Gray, *Olivella zonata* Duclos, *Olivella gracilis* B and S., *Oliva incrassata* Sol., and *Oliva polpasta* Duclos. For the San Felipe region he lists four species: *Oliva incrassata* Sol., *Olivella zanoeta* Duclos, *Olivella gracilis* Brod. & Sby., and *Olivella anazora* Duclos. Without checking with the San Diego Museum of Natural History we assume that his *anazora is* our *dama,* the most abundant species in the San Felipe region.

We found *Agaronia hiatula* Gmelin (Lowe's *testacea*) on the shores of Punta Peñasco (Rocky Point) Bay, where they were living higher on the beach than any other species of olive shell. In the Punta Peñasco region *Agaronia* is of limited distribution, not being found by us in La Cholla Bay some ten miles to the northwest of Puerto Peñasco. At San Felipe Bay and nearby Ensenada Blanca on the west shore, no *Agaronia* was found.

In San Felipe Bay and neighboring Ensenada Blanca we collected *Olivella undatella* Lam., a species we were especially interested in finding, since it had been uncovered in ancient graves

[1] The Nautilus, vol. 48, pp. 1–4, 43–46, 1934.

[2] Transactions of the San Diego Society of Natural History, vol. 8, pp. 15–32, 1935.

[3] The Nautilus, vol. 47, pp. 45–47, 1933.

in Coachella Valley, Riverside County, California, and we never knew the source of the shells. Presumably they must have been obtained by the Indians from the Baja Californian shore of the Gulf.

Aside from *Agaronia hiatula* found by us on only the eastern side of the Gulf and *Olivella undatella* found only on the western side, the other four species of Olividae collected occurred on both shores. *Olivella dama* was by far the most abundant species in both regions. *Olivella gracilis* was represented by only one specimen from the east side, by numerous specimens from the west side. *Olivella zanoeta* was rare at San Felipe, fairly common at Puerto Peñasco. Presumably Lowe's *zonata* is *zanoeta*.

On the eastern shore of the Gulf *Oliva spicata* Bolten (Lowe's *polpasta*) was abundant in La Cholla Bay but lacking in Punta Peñasco Bay. On the western shore we found none in San Felipe Bay, but collected a few very young ones in Ensenada Blanca. The season may have had something to do with this. We were at San Felipe in latter January, 1951, which may have been too early. Our observation, with California species at least, is that they are abundant on the beaches in summer and rare or absent in winter, when they perhaps retire to deeper water. This is probably the explanation, too, of the fact that we found only seventeen *Oliva incrassata* at San Felipe in January, whereas Lowe found them abundant in May. Similarly, we found them at Puerto Peñasco in October when the water was still warm, but failed to discover more than a single specimen in December and January when the weather and the sea were cold.

With regard to *Oliva incrassata* it has been remarked by Tryon:[4] "The young shell is not angulated, and approximates to the last species [*polpasta*] in form, and somewhat in exterior coloring, but may be distinguished at once by the color of the columella and interior." We observed that in life *incrassata* and *spicata* are readily distinguishable by their soft parts. The former has fawn colored flesh with brown spots; the latter has buffish flesh with paler brown short wavy lines. *Agaronia* has usually grayish flesh, sometimes buffish, but these differences are not correlated with differences in shell color.

[4] George W. Tryon, Jr., Manual of Conchology, vol. 5, p. 82, 1883.

THREE NEW LAND SNAILS FROM EASTERN UNITED STATES

By LESLIE HUBRICHT

Pallifera mutabilis, new species.

Very young with a dark gray band on each side, connected to a dorsal band by a series of oblique stripes on a light background. With age the markings become browner, the dorsal band disappears, and the oblique stripes break up into a series of spots. Adults have a fine brownish flecking on a pale buffy background with scattered dark gray-brown spots, remnants of the oblique stripes; a band on each side, the upper margin of which is sharp but irregular, the lower margin indistinct, fading gradually into the general background color. The margin of the foot is olive-gray.

Size large, reaching a length of 100 mm. or more when fully extended in crawling, but usually somewhat smaller, the holotype being 62 mm. long preserved in alcohol.

Jaw arcuate, cutting edge with a median projection, usually smooth in the middle, with from five to eight ribs on each side.

The penis is shaped much as in *P. dorsalis* but contains seven longitudinal papillose ridges. The anterior half of the spermathecal duct is much enlarged, being larger than either the penis or oviduct, and contains seven non-papillose longitudinal ridges.

Pallifera mutabilis is related to *P. wetherbyi* W. G. Binney which it resembles in its large size, and in the jaw. It differs markedly in color pattern. In *P. wetherbyi* there are no lateral bands, the oblique stripes are fewer in number, broader, and darker, and do not break up into spots with age.

Type Locality.—Upland oak woods, just west of Schoolfield, Pittsylvania Co., Virginia. Holotype 187104, A.N.S.P., paratypes in the collection of the author.

Distribution.—MARYLAND: Cecil Co.: woods, 0.5 miles west of Rising Sun. VIRGINIA: Nansemond Co.; Dismal Co.; Dismal Swamp, 2 miles southeast of Suffolk; just east of Suffolk. Mecklenburg Co.: bluffs of Dan River, at US-1. Halifax Co.: Staunton River Bluff, Staunton River State Park; upland woods, 2 miles northwest of Omega. Campbell Co.: near river, Altavista. Pittsylvania Co.: bluff along Banister River, 1.5 miles northwest of Riceville; roadside, US-58, north of Danville; 2 miles northeast of Bachelors Hall; bluff along Staunton River, 5 miles north of Sandy level; woods, just west of Schoolfield. Allegheny Co.: wooded hillside, near Griffith, 6 miles northeast

of Clifton Forge; 2 miles southwest of Lowmoor. Montgomery Co.: Tyler Ridge, Radford. NORTH CAROLINA: Bertie Co.: waste ground, Windsor. Edgecombe Co.: 2 miles northwest of Pine Top. Greene Co.: 7 miles northwest of Snow Hill. Martin Co.: near Sweet Water Creek, 1.3 miles southeast of Williamston. Lenoir Co.: swamp, 6 miles south of Woodington. Bladen Co.: near White Oak; Cape Fear River bluff, Elizabethtown. Brunswick Co.: vacant lot, Southport; Wet Ash Swamp, 2 miles southeast of Ash. Rockingham Co.: upland oak woods, 5 miles east of Draper. Swain Co.: near Smokemont Camp Grounds, Great Smoky Mountains National Park. SOUTH CAROLINA: Darlington Co.: waste ground, Society Hill. WEST VIRGINIA: Fayette Co.: near New River, 1 mile southeast of Gauley Bridge. TENNESSEE: Campbell Co.: cedar glade near mouth of Doakes Creek, 10 miles northeast of LaFollette. Carter Co.: Doe River bluff, 1 mile northwest of Hampton. Anderson Co.: Clinch River bluff, 4 miles southwest of Clinton. Sevier Co.: headquarters, Great Smoky Mountain National Park, 4 miles south of Gatlinburg. Marion Co.: near large spring, 2 miles northeast of Sequatchie. ILLINOIS: Union Co.: Fountain Bluff. 1 mile south of Gorham; 3.5 miles southwest of Ava. MISSOURI: St. Louis Co.: Rockwoods Reservation; Fox Creek Gap, 1 mile west of Allenton; 4.5 miles east of Eureka; Musicks Ferry; 1 mile southeast of Valley Park; Creve Coeur Lake Park; Osage Hills, Kirkwood. Jefferson Co.: bluffs along Rock Creek, 0.5 mile southeast of Seckman; mouth of small cave on hillside, 0.5 mile south of Rush Tower. Franklin Co.: 1 mile southwest of Port Royal; bluff along Meramec River, 2 miles south of Gray Summit. Boone Co.: bluff along Brush Creek, 4 miles southeast of Ashland. Camden Co.: Hahatonka. Miller Co.: Osage River bluff, east of Brumley.

PUNCTUM (PSEUDOPUNCTUM) LAMELLATUM, new species.

Shell minute, pale brown to vitreous, translucent, depressed conoid, whorls 3.5 to 4, slightly oval in cross-section. Umbilicate, the umbilicus contained 3 to 3.5 times in diameter of shell. Aperture wider than high. Major growth riblets not prominent, the interspaces with 1 to 3 minor growth ridges. Spiral striae very weak, requiring a magnification of 150× to make them visible Base of the body whorl of mature shells armed with a low lamella which is a half whorl long. Immature shells without a lamella.

Punctum lamellatum is closely related to *P. smithi*, with which it was found, and which it resembles in shape and sculpture. It differs in being lighter colored, and in having a much longer and more slender lamella.

Height 0.7 mm. Diam. 1.2 mm. Diam. of umbilicus 0.4 mm. Holotype.

Localities.—VIRGINIA: Bedford Co.: among leaves, summit of Smith Mountain, 20 miles south of Bedford. Holotype 187103, A.N.S.P., paratypes in the collection of the author. Pittsylvania Co.: bluff along Staunton River, 3 miles northwest of Brights; woods, just west of Schoolfield.

CARYCHIUM COSTATUM, new species.

Because there is nothing in Dr. H. A. Pilsbry's description of *C. exile* (Land Mollusca of North America, p. 1158) which would not also fit this new species it seems best to describe it by a comparison with that species.

Differs from *Carychium exile* H. C. Lea in being larger, whiter, the rib striae are higher, tending to be bluntly angular rather than rounded, and extend higher up the shell. The lip does not have the heavy thickening usually found in *exile*. The internal lamella is similar but the margin is more sinuous.

Height 1.9 mm. Diam. 0.8 mm. Ht. Ap. 0.7 mm. Holotype.

Height 1.85 mm. Diam. 9.7 mm. Ht. Ap. 0.6 mm. Radford.

Height 1.9 mm. Diam. 0.75 mm. Ht. Ap. 0.7 mm. Kibler Park.

Distribution.—WEST VIRGINIA: Fayette Co.: below Cane Branch Falls, 1.3 miles southeast of Gauley Bridge, Type 187102, A.N.S.P., paratypes in the collection of the author. VIRGINIA: Pulaski Co.: ravine, opposite Radford. Patrick Co.: ravine, near Kibler Park, below Pinnacles Power House. Washington Co.: Laurel thicket, base of Laurel Mtn., 4 miles southwest of Konnarock; 1 mile south of Damascus. Pittsylvania Co.: bluffs along Staunton River, 3 miles northwest of Brights. NORTH CAROLINA: Macon Co.: Wallace Gap, Nantahala Mtn., 2 miles east of Slagle.

At the type locality this species was found associated with *C. exile* from which it differed enough so that the two species could be separated with the unaided eye. Most lots of *exile* show a noticeable variation in proportions between individuals. In this species the individuals of each lot are remarkably uniform.

A REPORT ON LAND SNAILS OF THE JACKSON HOLE REGION, WYOMING

By LORNA R. LEVI and HERBERT W. LEVI [1]
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This paper is a short report on the land snails found in the Jackson Hole Region and Teton Mountains in northwestern Wyoming during a month's stay at the Jackson Hole Research Laboratory of the New York Zoological Society. The collection of snails was part of a study of the invertebrate fauna of this region, carried out between July 15 and August 15, 1950. Henderson's (1933, 1936) records for this region are included in our list.

The authors want to thank Dr. H. A. Pilsbry and Mr. C. Wurtz for help in identification of some of the more difficult snails, Mrs. D. Beetle of Laramie, Wyoming, for her records of some snails of this region, and Dr. D. Lowrie for his contributions to our collection.

Land Snails Known from Jackson Hole Region

Family Camaenidae

Oreohelix subrudis ("Pfeiffer," Reeve) [2]
Oreohelix strigosa depressa (Cockerell) [3]

Family Sagdidae

Microphysula ingersolli (Bld.) [3]

Family Zonitidae

Euconulus fulvus alaskensis (Pilsbry) [2]
Retinella electrina (Gould)
Zonitoides arboreus (Say) [2]
Vitrina alaskana Dall [2]

Family Limacidae

Deroceras laeve (Müll.)

[1] Supported in part by a grant from The New York Zoological Society.
[2] Henderson's (1936) records verified.
[3] Listed by Henderson (1936) only.

Family Endodontidae

Discus cronkhitei (Newcomb) [2]
Discus shimeki shimeki (Pilsbry) [3]
Discus shimeki cockerelli Pilsbry
Punctum minutissimum (Lea) [2]

Family Succinidae

Succinea avara (Say) [2]
"*Succinea retusa* Lea" [3]

Family Pupillidae

Pupilla blandi Morse [3]
Pupilla muscorum (Linn.)
Vertigo concinnula Cockerell

Family Valloniidae

Vallonia cyclophorella Sterki [2]
Zoogenetes harpa (Say)

Spruce-fir Forest

Cascade Canyon, Grand Teton National Park. Near a small stream at the northwest end of Jenny Lake (elev. 6779 ft.), a single specimen of *Oreohelix subrudis* was found. The ground cover at this place was thimble berry (*Rubus* sp.). The trees were Engelmann spruce and alpine fir. Mrs. D. Beetle reports (personal communication) *Zonitoides arboreus, Vitrina alaskana,* and *Pupilla muscorum* from Cascade Canyon.

Death Canyon, Grand Teton National Park. Under logs on the humid canyon floor were found *Oreohelix subrudis* and *Vitrina alaskana.* The trees were Engelmann spruce and alpine fir. The ground beneath them was bare of herbaceous plants.

Pilgrim Creek, South of U. S. highway 287, Jackson Hole National Monument. Along the creek at this point the forest was mainly Engelmann spruce and alpine fir, but Colorado blue spruce and narrowleaf cottonwood were also present. *Euconulus fulvus alaskensis, Zonitoides arboreus, Vitrina alaskana, Discus cronkhitei, Vertigo concinnula,* and *Vallonia cyclophorella* were collected there.

Uhl Hill, near Elk, Teton National Forest. The forest on the north facing slope near the crest of the hill was Engelmann spruce and Douglas fir. Grasses covered the ground. *Euconulus fulvus alaskensis* and *Vertigo concinnula* were found in rotten logs.

Lodgepole Pine Forest

Leigh Lake, Grand Teton National Park (elev. 6870 ft.). *Euconulus fulvus alaskensis, Zonitoides arboreus, Vitrina alaskana, Vertigo concinnula* and *Zoogenetes harpa* were found under pieces of wood along the Leigh Lake trail. *Zoogenetes* was found also in lodgepole pine woods at Pebble Creek camp ground, in Yellowstone National Park. The records from Jackson Hole are of interest because earlier workers had considered the species rare, possibly introduced (Henderson, 1936; March, 1942). If so, it has increased, for it was found abundantly in some places, and did not appear to be uncommon in the region.

Emma Matilda Lake, Jackson Hole National Monument. Wet wood chips and old logs in the mature pine woods on the east shore of this lake yielded young *Oreohelix subrudis, Euconulus fulvus alaskensis, Zonitoides arboreus, Vitrina alaskana, Punctum minutissimum, Vertigo concinnula, Vallonia cyclophorella, and Zoogenetes harpa.*

Pilgrim Creek, North of Moran, Jackson Hole National Monument. From islands of lodgepole pine scattered in a dry grassy area, *Vitrina alaskana* was collected. Under logs lying in grass along the edge of more continuous pine woods were found *Oreohelix subrudis, Euconulus fulvus alaskensis, Zonitoides arboreus, Vitrina alaskana,* and *Vertigo concinula.*

Signal Mountain, Jackson Hole National Monument (elev. 7250 ft.). From boards lying along the foot trail were collected *Euconulus fulvus alaskensis, Zonitoides arboreus, Vitrina alaskana, Discus shimeki cockerelli, Punctum minutissimum,* and *Vertigo concinnula.* Of the Jackson Hole localities, Signal Mountain was the only one from which *Discus shimeki cockerelli* was collected. *Discus cronkhitei* was not found at this location, though the two were found together in pine woods at Pebble Creek camp ground in Yellowstone National Park. Both Signal Mountain and Pebble Creek have some limestone.

Two Ocean Lake, Jackson Hole National Monument. *Zonitoides arboreus* and *Vitrina alaskana* were collected in pine woods near this lake.

Aspen Grove

Aspen trees usually occur in about even-age stands which have very little brushy growth and a ground cover primarily of grasses and herbaceous plants. Under bark, branches, stones, and in leaf litter were found many species of snails.

Two Ocean Lake, Jackson Hole National Monument. This particular grove had a ground cover of timothy hay, the seeds of which may have been carried in by pack trips which camped there. Our search yielded *Oreohelix subrudis, Zonitoides arboreus* and *Vitrina alaskana.*

Gros Ventre Slide, south of Slide Lake, Teton National Forest. This area was one of the few which had abundant limestone. Leaf litter from an aspen grove here was sifted, and was found to contain *Euconulus fulvus alaskensis, Zonitoides arboreus, Vitrina alaskana, Discus cronkhitei, Pupilla muscorum, Vertigo concinnula, Vallonia cyclophorella* and *Zoogenetes harpa.*

Moran, south of dam, w. of highway, Jackson Hole National Monument. A large colony of *Oreohelix subrudis,* including several animals with plain white shells, was found here. The collection was made during a dry period, and most of the animals were found to be aestivating, each with a dry leaf fastened tightly to its aperture. *Euconulus fulvus alaskensis, Zonitoides arboreus, Vitrina alaskana, Discus cronkhitei, Punctum minutissimum,* and *Pupilla muscorum* were obtained by sifting leaf litter.

Elk, Teton National Forest. At a grazed roadside aspen grove near Elk, *Discus cronkhitei* and *Vertigo concinnula* were found.

Indian Paint Brush Canyon, Grand Teton National Park. On the Canyon trail, where it passed through an aspen grove, was found a single shell of *Oreohelix subrudis.* No further collecting was done there.

Mount Baldy, Teton National Forest. In an old stump, *Zonitoides arboreus, Pupilla muscorum,* and *Vertigo concinnula* were found.

Wildlife Park, Moran, Jackson Hole National Monument (elev. 6749 ft.). The leaf litter here yielded *Oreohelix subrudis, Zonitoides arboreus, Vitrina alaskana,* and *Succinea avara.*

River Bottom

The three river bottom habitats in which we collected were similar, each having cottonwood trees, abundant shrubby willows, and a ground cover of high grasses.

Wildlife park along Snake River near Moran, Jackson Hole National Monument. *Succinea avara* was found on driftwood and vegetation along the edge, both above and below the surface, of a small stream flowing into the Snake River. *Deroceras laeve* was found along the same stream. Under logs and driftwood on drier ground were found *Zonitoides arboreus, Vitrina alaskana* and *Pupilla muscorum.*

Cottonwood Creek, east of U. S. highway 187 bridge, Jackson Hole National Monument. Under fallen logs and driftwood were found *Oreohelix subrudis, Euconulus fulvus alaskensis, Retinella electrina, Zonitoides arboreus, Vitrina alaskana* and *Discus cronkhitei.*

Gros Ventre Creek, west of highway 187 bridge, Jackson Hole National Monument. *Zonitoides arboreus* was found under driftwood on the grassy bank. *Succinea avara* was found along the north bank, close to the water.

Other Habitats

Two Ocean Lake, Jackson Hole National Monument. Tall grasses on poorly drained soil near the lake were swept for arthropods. A specimen of *Succinea avara* was picked up in the net.

Blacktail Butte, Jackson Hole National Monument. From a grazed slope with balsam root (*Balsamorrhiza* sp.) and grasses, *Oreohelix subrudis* was collected.

Signal Mountain, Jackson Hole National Monument. A vertical bog, at the base of the mountain (elev. 6776 ft.) on its north side, was searched. Pieces of wood and bark had on them *Zonitoides arboreus, Discus shimeki cockerelli,* and *Vertigo concinnula.* Halfway up the mountain (elev. 7250 ft.), under

rocks at the base of a north facing limestone cliff, were found *Euconulus fulvus alaskensis, Vitrina alaskana, Discus shimeki cockerelli, Punctum minutissimum, Pupilla muscorum* and *Vertigo concinnula.*

Gros Ventre Slike, Teton National Forest. Several shells of *Oreohelix subrudis* were found in the talus at the base of the Gros Ventre Slide. The vegetation, mostly buffalo berry (*Shepherdia* sp.), was very sparse.

Blacktail Butte, Jackson Hole National Monument. Shells of *Oreohelix subrudis* were found in the talus below a cliff. Here there was no vegetation except for several prostrate, dead pine trees.

Pilgrim Creek, south of U. S. highway 287 bridge, Jackson Hole National Monument. In this locality, driftwood lying on the bare gravel of the creek bed provided the only cover for snails. Young specimens of *Oreohelix subrudis* were found, along with *Zonitoides arboreus, Vitrina alaskana, Vertigo concinnula,* and *Vallonia cyclophorella.*

Uhl Hill, near Elk, Teton National Forest. *Vallonia cyclophorella* was found under boards lying on the grassy banks of an irrigation ditch at the foot of Uhl Hill.

Sawmill Ponds near Moose, Jackson Hole National Monument. On a stony slope with sagebrush were found several shells of *Oreohelix subrudis.*

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AMERICAN MALACOLOGICAL UNION, 1951

The Buffalo Society of Natural Sciences of Buffalo, N. Y., aided by the Conchological Section of the same organization entertained the American Malacological Union as that body held its seventeenth annual meeting August 22nd to 24th of this year. It was the second largest gathering in the history of the A.M.U., with seventy-five registered, and surpassed only by the 1947 meeting at Pacific Grove, California, at which time the attendance totaled eighty-six.

Careful and detailed planning by committees of Section members appointed by Section President Imogene C. Robertson, and the unlimited hospitality of the Director and staff of the Buffalo Museum of Science, made for one of the most successful conventions in years; it was called to order in the Museum auditorium on Wednesday afternoon, August 22nd, following a morning period of registration, council meeting and open house in the Museum in general. President Joseph P. E. Morrison opened the session by introducing Mr. Fred T. Hall, Director of the Buffalo Museum of Science; Mr. Hall in welcoming his guests assured them that any unforeseen wants in connection with their convenience or comfort needed but to be voiced to him or to any of the Museum staff. Dr. Morrison in reply assured him that the facilities provided were most ample and complete, and extended his personal thanks and those of the American Malacological Union to Mr. Hall and to the Buffalo Society of Natural Sciences. Then introducing the first speaker, he launched the academic portion of the opening session. These papers were presented on Wednesday:

"Trends in Malacology," Mr. Wm. J. Clench; "Comparison of the Mollusks in Adjacent Ohio River and Lake Erie Drainage," Dr. Ralph W. Dexter; "Gastropods and the Ecology of Loess Deposition," Dr. A. Byron Leonard; "An Old Problem in Naiad Nomenclature," Dr. Henry van der Schalie; "The Preputial Organ in Snails of the Genus Helisoma," Mr. Emile Abdel-Malek, presented by Dr. van der Schalie.

The annual dinner took place on Wednesday evening in the

dining rooms of the convention headquarters, Hotel Lenox, and honored especially Mrs. Imogene C. Robertson who had served the A.M.U. as secretary since its inception twenty years ago. On behalf of the Union she was presented with three volumes of John W. Taylor's "Monograph of Land and Fresh Water Mollusca of the British Isles"; in making the presentation Dr. Paul Bartsch lauded Mrs. Robertson and her husband, the late Harold R. Robertson, for their long and faithful services as secretary and treasurer, respectively. She was also the recipient of a corsage of gardenias and rosebuds, the gift of the Conchological Section. For these tributes Mrs. Robertson gave brief but sincere thanks, saying that to both her and Mr. Robertson their efforts had been truly a labor of love.

The evening was then given over to Dr. Albert Mead of the University of Arizona who delivered an interesting travelogue entitled, "Hunting the Giant African Snail in Micronesia." A menace though he may be, *Achatina fulica* on this occasion was high on the list as an entertainment factor, for the tale of his pursuit was illustrated by Kodachrome slides and spiced by Dr. Mead's sparkling monologue.

Thursday morning's sessions opened with the report of the council meeting, and the following slate of nominated officers was presented: President, Dr. Jeanne S. Schwengel; Vice President, Mrs. Imogene C. Robertson; Secretary and Treasurer, Mrs. Margaret C. Teskey (in accepting nomination for Vice President, Mrs. Robertson resigned her post as Secretary; the post of Treasurer was left vacant by the death of Mr. Harold R. Robertson); Councilmen: Mr. R. Tucker Abbott, Dr. Carlos G. Aguayo, Dr. Leo G. Hertline, Dr. A. Byron Leonard. The panel as read was elected without opposition.

The remainder of the day was given over to papers, as follows: "World Relations of the Melanians," Dr. J. P. E. Morrison; "Land Snails of the Piedmont Region of North Carolina," Dr. Charlotte Dawley; "Some Problems in the Pholadidae," Miss Ruth D. Turner; "Genetic Analysis of Wild Populations of the Land Snail Cerion," Mr. R. Tucker Abbott; "Triton's Pipe Organ," Mrs. Gertrude V. Musial; "Malacological Legislation,"

Dr. Albert R. Mead; "The Story of Tyrian Purple," Mr. R. Tucker Abbott; "Portraits of Some Florida Opisthobranchs," Dr. Henry A. Pilsbry; "Glimpses of the Past," Dr. Paul Bartsch; "Carving of Niagara Gorge," Mr. John D. Sargent.

In the evening General Frank R. Schwengel and Dr. Jeanne S. Schwengel entertained the delegates at a cocktail party and buffet supper at Hotel Lenox; as always it was a sparkling affair and much enjoyed.

Friday was given over to the field trip, traditional at these yearly meetings. A large bus transported forty happy snailers on a sightseeing tour of the Niagara Frontier, highlighted by a collecting trip into Niagara Glen, Ontario, with more collecting on the return trip, this time at the foot of the American Falls. There Nature cooperated by blowing the spray away so that the rocks so rich in snails might be visited without rain attire. The excursion ended at 6:00 P.M., and ended also the seventeenth annual meeting of the American Malacological Union.

Margaret C. Teskey,
Secretary, American Malacological Union.

Harold R. Robertson

We have to announce with deep regret the death in August, at 73 years of age, of a charter member of the American Malacological Union. Mr. Robertson was born in Liverpool, England, coming to this country as a young man. In 1903 he married Imogene Strickler, daughter of one of South Buffalo's pioneer families. The couple had since resided in South Buffalo, New York.

Mr. Robertson was a member of the microscopical and conchological sections of the Buffalo Society of Natural Sciences, and for a long time served as treasurer of the A.M.U. Through these activities he was widely known to our readers, and many will join us in sympathy for Mrs. Robertson and family.

NOTES AND NEWS

Bulimulus diaphanus Pfeiffer.—Dr. Preston E. Cloud of the United States Geological Survey kindly submitted a small collection of fossil and recent land shells from Mona Island, Puerto Rico, for study. This material was collected by Clifford A. Kaye during a visit to this island in 1950. *Bulimulus diaphanus* Pfr. was obtained both recent and in a fossil state. This species is an addition to the list of the land mollusks which I recently published (1951, Journal de Conchyliologie 90, pp. 269–276). We possess specimens of this species from several localities in addition to those given in the Manual of Conchology by Pilsbry (1897, (2) 11, p. 47). These additional localities are: Vieque Island and Guanica, Puerto Rico; St. Croix, Virgin Islands; Anegada Island, Lesser Antilles.—William J. Clench.

Caecum biminicola, new species. Plate 1, fig. 13.—The shell is moderately curved, slowly tapering, with sculpture of about 18 lengthwise riblets about as wide as their intervals, their summits undulating. Anteriorly the tube is a little enlarged forming a ring of low oblong tubercles, beyond which it contracts, and there is a very narrow smooth peristome rim. The posterior plug is very low, highest at the convex side of the tube where it projects in a short, rounded mucro in a slightly immature paratype, but this is worn down in the type. The type is white, a paratype having several transverse light drab tracts. Length 2.5 mm., greatest diameter 0.8 mm. The multispiral operculum is slightly concave with a smooth central concavity.

Bimini Islands, collected by Mr. Jay A. Weber. Type 187784 ANSP.

The chief peculiarity of this species is that the summits of the ribs are waved, forming low oblong tubercles in the type, the waves more irregular in the paratype. The dry animal and the operculum are seen projecting from the aperture in the figure.—Pilsbry.

Drymaeus multilineatus, form osmenti Clench.—This color form (1948, Nautilus **62**, p. 36) was described again in the last number of the Nautilus (1951, **65**, p. 34) under the name of

eboreus Grimshaw. Both lots came from the same area on Little Pine Key, Lower Florida Keys.—W. J. Clench.

Oxychilus draparnaldi (Beck) in Cambridge, Massachusetts.—This species has just been discovered (September 1951) in the center of Cambridge, living under leaves in gardens of this city. Both live and dead specimens were found though they were not common. It would appear to be on this evidence a rather recent introduction. This species has generally been known under the name of *O. lucidus* (Draparnaud) (Pilsbry, 1946, Land Mollusca of North America, Mono. no. 3, **2**, pt. 2, p. 250).—W. J. Clench.

Strombus pugilis alatus L., in South Carolina.—The finding on May 20, 1951, by myself and a friend, of two *Strombus p. alatus* L. on the beach of Garden City, South Carolina, about 90 miles northeast of Charleston, seems interesting enough to warrant hunting up the records of previous findings. The shells are battered, but not worm eaten, with neither barnacles nor crepidulas on them, and have a faint tinge of color—definitely not bleached out.

The monograph by Clench & Abbott, on "Strombidae of the Western Atlantic," in Johnsonia, No. I, 1941, cites the finding of one of these shells on Shackelford's Island, N. E., but with no date given; also a reference to Mazyck's "Catalogue of Mollusks of So. Car.," 1913, p. 15. This reference, however, Mazyck quoted from Gibbes, 1848. The only other records which I have been able to find are from the Charleston Museum collection: Pawley's Island, Oct. 20, 1929, about 70 miles northwest of Charleston; Botany Beach, Edisto Island, Oct. 7, 1940, 50 miles southeast of Charleston; Sullivan's Island, Jan. 1940, right off Charleston, and one which Thomas Uzzell found recently, also on Sullivan's.

So far as any records available here show, these are the only noted findings of the *Strombus p. alatus* on the South Carolina coast in over 100 years.—Susan A. Bennett, 37 Legare St., Charleston, S. C.

PUBLICATIONS RECEIVED

Glossary of the Greek and Latin names of marine Mollusca occurring on the east coast of North America. By Henry Poirier. 69 pp., mimeographed. $1.60. Sold by Roger Bretet, Apt. L 1, 115 Pinehurst Ave., New York 33. 1951. This very useful pamphlet gives the English meanings of the names of all the commoner species. The genders of the generic names are also helpful. The arrangement is systematic with an alphabetic index of generic names and of trivial terms. The alternating blank pages will make it a handy checklist for collections. Misspellings are remarkably few; the following in genera are noted: *Aclys* (p. 30) for *Aclis* Loven, 1846, which seems good Latin. *Spissula* (p. 20), Mörch, 1853, a sensible emendation of *Spisula* Gray, 1837. *Vellutina* (p. 32) for *Velutina* Fleming, 1822, which is closer to the French. Pilsbry points out that the sides of *Lepidopleurus* (p. 1) are scaly (Gr. lepid-) rather than graceful.—H. B. B.

Studies on Schistosomiasis Japonica. By T. P. Pesigan and staff. Philippine Med. Assoc., vol. 27, no. 4, pp. 203–332. 1951. Many new records of the occurrence of *Oncomelania quadrasi* Mlldff. (Amnicolidae), the snail carrier of the Oriental blood fluke, are given for the Philippines, including important records for Luzon Island. Habitat notes and details of snail control experiments are presented in this exhaustive study. An important and complete annotated bibliography is included.—R. T. Abbott.

The snail hosts of Bilharzia in Africa. Their Occurrence and Destruction. By Alan Mozley. vii + 78. Illus. 9 shillings. H. K. Lewis and Co., Ltd., London. 1951. This compact handbook is of great importance to the millions of people living in Africa where the fatal, snail-borne blood-fluke diseases are the leading medical problem. The book is written in a very simple style and illustrated with care, so that the layman and native technician will find it extremely easy to use. Mozley has done a

masterly job in making it possible for anyone capable of reading English to identify any of the African snail carriers of schistosomiasis or bilharzia. The breeding habits, eggs, development, and habitats of the dangerous species are discussed and illustrated. Instructive details are given on the control of snails in Africa. Mozley recommends the use of the native mineral, malachite, which is a copper carbonate. Porous bags containing powdered malachite are dipped in and out of the water several times. Other chemicals and methods of application are given.—R. T. Abbott.

Field tests of Molluscacides against *Australorbis glabratus* in endemic areas of Schistosomiasis in Puerto Rico. By E. G. Berry *et al.* Reprint 3033, U. S. Public Health Reports, vol. 65, no. 30, pp. 939–950. 1950. Malacologists who are asked for information on the chemical control of fresh-water pulmonates will find this a useful reference. Two compounds (copper pentachlorophenate and sodium pentachlorophenate) were found to be excellent field molluscacides and their cost is reasonable. The latter at 9.5 p.p.m. calculated on a 6-hour flow-rate dose destroyed all snails and eggs for a distance of 1½ miles downstream. It was also lethal to fish, but not crayfish.—R. T. Abbott.

Notes on Hamilton County (Ohio) land snails. By Howard H. Halteman. Privately published. 1951. 28 species are listed.—H. B. B.

THE NAUTILUS

Vol. 65 JANUARY, 1952 No. 3

BARNEA TRUNCATA (SAY) AT SOUTH CAPE MAY, NEW JERSEY

By ROBERT C. ALEXANDER

The beach at South Cape May between Cape May City and Cape May Point at the southern tip of New Jersey is being eaten away by the ocean. Only a solitary house remains of fifteen or more houses that stood at South Cape May in 1950, all the others having been wrecked or washed away by a severe storm on November 25th of that year. There are indications that the ocean may again break through the protecting strip of beach to form an inlet near the spot where an old inlet is said to have existed many years ago. As the ocean washes the sand away, flats of old meadow sod are exposed along the shore, showing that this was meadow land in the past before the sand covered it. Maps of the region in the time of the Revolutionary War show that the land extended farther out than it does at present, and shoals which are now submerged may have been above the water and connected with the present shoreline by low-lying land. Dr. Horace G. Richards and others have observed the imprints of horses' hoofs in the exposed sod, and the remains of an old corduroy road heading directly into the ocean, giving confirmation to the belief that where there is ocean now there used to be dry land, where the early settlers took their livestock to graze and went to gather hay and cut wood, perhaps two hundred years ago. This submerged meadow sod now provides a home for boring mollusks.

Occasionally, when chunks of old meadow sod are torn loose from the ocean bottom during storms and cast ashore by the waves, mollusks that are not ordinarily seen alive may be found in them. During a trip to the beach at South Cape May on September 9, 1951, I found the shore littered with debris washed up by a stormy surf. In large pieces of meadow sod cast

up by the waves, there were full-grown living specimens of the Truncated Piddock, *Barnea truncata* (Say), which because of its fragile shell and habit of burrowing deep into sod and clay is one of the more difficult species to collect alive and in good condition. Here was an opportunity to obtain perfect living specimens of this mollusk simply by breaking apart the chunks of sod washed up on the beach. From two pieces of sod, I secured nearly two dozen specimens whose shells measured about 2¼ inches in length, as well as living specimens of the Small Razor Clam, *Ensis minor* Dall, and the Small or False Angel-wing, *Petricola pholadiformis* Lamarck, which is plentiful in this locality. These specimens have been presented to the Academy of Natural Sciences of Philadelphia, Penna.

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MOLLUSCAN SHELLS OCCUPIED BY TANAIDS

By ARTHUR D. HOWARD *

When collecting shells we usually note those occupied by hermit crabs. Among some shells from Concepcion Bay, Lower California, was one of the Caecidae apparently host to a hermit crab. As we had never seen so small a shell occupied by a decapod we photographed it. On showing it to a specialist on Crustacea, he said it looked like an Isopod but that to be sure we would have to remove the crustacean from the shell. We had given it to a student of the Paguridae who removed the animal so as to expose the posterior part covered by the shell. He verified our opinion that it was not a hermit crab and according to our crustacean specialist, Dr. Menzies, the animal belonged to the

* Contribution no. 83 from the Allan Hancock Foundation, University of Southern California, Los Angeles, California.

genus, *Pagurapseudes,* one of the chelate Tanaids known to be adapted for dwelling within an unoccupied molluscan shell. The abdominal segments of this Tanaid are coiled up somewhat as in the hermit crabs. One investigator reports that they have been found occupying the same shell with small Paguridae. The mollusks, one of the Caecidae, was identified provisionally as a species of *Micranellum,* is 3 mm. long and less than 1 mm. in diameter (Pl. 5, fig. 3). Subsequently we found the shell of another mollusk likewise occupied by a crustacean much smaller than a hermit crab as usually observed. Upon more careful examination there proved to be twe crustacea lying side by side in a walled off portion beneath the horizontal shelf of the mollusk. The shell measuring 3 mm. long by 2.5 mm. wide was that of a *Crepidula.* The crustacean was identified as a Tanaid (provisionally) of the genus *Synopseudes.* This Synopseudes, shown in photograph Plate 5, fig. 4, is somewhat different from Pagurapseudes in that it possesses only 3 abdominal segments whereas there are six in Pagurapseudes.

The *Crepidula* with its contained crustacean was taken in shore collecting south of Salina Cruz, Oaxaca, Mexico, Jan. 10, 1947. In this same collection we found a pelecypod shell occupied by this same species of Synopseudes apparently. It lay the full length of the shell, the two valves lying apart about one quarter opening. Photographs of the first two associations are shown herewith. The two are magnified twenty-five times. The Synopseudes free from a shell is shown in Plate 5, fig. 4. The photographers are Daniel H. Chapman and B. Fortin.

A NEW RECORD OF HELIX ASPERSA MÜLLER

By HOWARD KNIGHT

Weber College, Ogden, Utah

About November 15, 1950, a snail was brought to the author for identification and advice about its control, as it was reported doing considerable damage to gardens in Ogden, Utah. Dr. Henry Van der Schalie, University of Michigan, determined it to be *Helix aspersa* Müller, the brown garden snail.

"The shell is imperforate or nearly so, obliquely globose, yellow, typically with 1(23)45 bands of chestnut-brown to chocolate, the bands interrupted by yellow flecks or streaks . . . last whorl with rather coarse, unequal wrinkles. The last whorl descends in front. Lip reflected, white, dilated over and usually closing the umbilicus" (Pilsbry, 1939).

The average of measurements on nine local specimens are: diameter, 28.8; height, 20.5. *H. aspersa* is Utah's largest snail.

This snail has been known in the United States since 1839 when a specimen was received from Europe by a Dr. Gould of Portland, Maine. This one was probably from France or southern Europe. Distribution in the United States at present is reported by Pilsbry (1939) and Abbott (1950) as the New England coast, the coast region of the Carolinas, southern Louisiana near the mouth of Mississippi River, and the coast of California from San Diego north to the vicinity of San Francisco. Previous to the present report, there were no records from inland areas.

Searchers in the vicinity of Portland, Maine have been unable to find this snail in recent years, but many have been imported through the years for use as food, and probably some have escaped. Its most successful introduction was at San José, California, as reported by Pilsbry (1939). This introduction occurred in 1856. *H. aspersa* was imported to New Orleans from Spain, but how it came to Utah is not known at present.

Pilsbry (1939) lists this snail from South Carolina, Louisiana, and California, and calls attention to some variations in band formulae and colors among the specimens from these regions. The specimens from Utah are most like the California specimens he describes, which may be a clue to the origin of specimens found here.

Mr. Stanley Mulaik reports, ". . . some of these snails (dead) in a 30,000 volt power supply which came from the coast (California) by way of Ogden, or Hill Air Force Base." Several people living near the garden where our specimens were found report having purchased many garden plants and trees from California growers, which may explain the importation of these pests to Utah.

On March 21, 1951, three living snails and several empty shells were collected in the same garden plot and vicinity where the first specimens were taken in Ogden. The living snails were in

hibernation among the branches of myrtle, a prostrate plant growing on the north side of the house where no direct sun could ever strike. There were no living snails found in nearby sunny places, but several shells were found in sunlighted spots.

This animal is reported by Rust, 1914 and Abbott, 1950 as being a serious garden pest in the United States, and several people in Ogden have reported it destroying considerable portions of their gardens, particularly the leafy plants such as lettuce. In our laboratory, specimens have thrived several months on lettuce, sliced carrots, and rolled oats.

On February 2, 1951 there were 80 juvenile snails in the terrarium. They are light tan in color and the shell is somewhat translucent.

Two adults were seen in copulation on March 6, 1951, and again on March 23, 1951.

In the literature the brown garden snail is referred to as the escargot, and is considered an epicure's delight, which suggests a possible control measure.

Nine specimens measure as follows.

Height 19 mm., diameter 28 mm.
Height 22 mm., diameter 26.8 mm.
Height 21.6 mm., diameter 31.8 mm.
Height 21.2 mm., diameter 29 mm.
Height 22 mm., diameter 28 mm.
Height 19.5 mm., diameter 28.1 mm.
Height 19.3 mm., diameter 29 mm.
Height 20.7 mm., diameter 29.5 mm.
Height 19.2 mm., diameter 29 mm.

A NEW TEREBRA (HOFFMEYERI) FROM THE PHILIPPINES [1]

By R. TUCKER ABBOTT

Associate Curator, U. S. National Museum

A few year ago Mr. and Mrs. F. K. Hadley sent me a large set of a *Terebra* from the Republic of the Philippines for identification. A thorough search in the literature leads me to believe that they are undescribed. These specimens were collected by

[1] Published by permission of the Secretary of the Smithsonian Institution.

Major Harry Hoffmeyer (MC), USA, who was an enthusiastic lover of mollusks and an indefatigable collector. He gave his life in the service of his country during World War II while in the Philippines. We are honored in having the opportunity of naming this species after its discoverer.

Terebra (Strioterebrum) hoffmeyeri, n. sp. Plate 5, figs. 5–9.

Description.—Shell about 18 mm. in length, moderately slender, its width being about ¼ of its length; glossy, lead-gray with a light purplish-brown undertone; 2 nuclear whorls smooth and translucent-brown; the ribs and an ill-defined, narrow band below the suture lighter. Axial ribs fairly strong, angular, very slightly retractively slanting, and extending from suture to suture; from 15 to 17 ribs on the penultimate whorl, and the ribs in each whorl are usually lined up axially one below the other. On the last whorl the ribs extend ¾ the way down. The last few ribs are usually crowded together. Spiral sculpture of a row of indistinct punctations, one between each rib, defining a narrow subsutural band. In some specimens, numerous, microscopic, spiral scratches are found between the concave interstices of the ribs. Aperture slightly constricted. Interior of aperture chestnut-brown, with a narrow, whitish, spiral color band at each end. Outer lip sinuate, strongly flaring below and produced anteriorly well below the limit of the columella. This produces a rather well-defined but short siphonal canal which is pointed somewhat dorsally. Inner lip slightly callous. Columella inside the shell with a single, low, anteriorly-placed, spiral fold. Exteriorly, the siphonal fasciole bears two strong, equal-sized, spiral cords. At the base of the body whorl and above a spiral groove bordering the fasciole there is a very strong to moderately developed light-colored, spiral cord.

Length	Width	No. whorls	
17.0 mm.	4.2 mm.	13.	Holotype, U.S.N.M. No. 598077
22.6 mm.	4.9 mm.	13.	Paratypes, U.S.N.M. No. 596972
16.0 mm.	4.1 mm.	12.	Paratypes, U.S.N.M. No. 596972

Of 300 paratypes measured for their length, the smallest was 12.5 mm., the largest 23.0 mm., and 52.6 percent of the lot fell between 17 and 19 mm. The mean was 17.6, the mode 18.0 mm.

Type locality.—Pasay Beach, Manila Bay, Luzon Id., Republic of the Philippines. Harry Hoffmeyer, collector. May to August, 1939.

Types. The holotype, fig. 8, is in U.S.N.M. No. 598077; 50

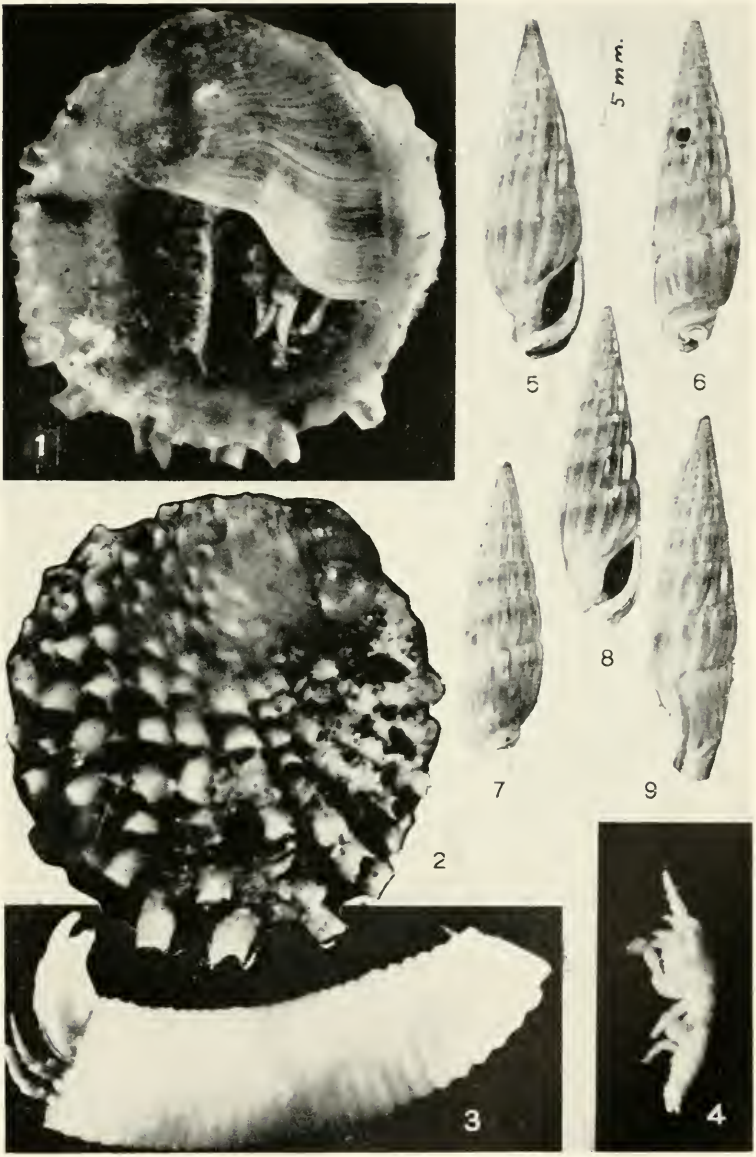

FIG. 1, 2, *Crepidula aculeata* (Gm.) with two *Synopseudes* lying beneath shelf. 3, a Tanaid, *Pagaropseudes*, in Caecum shell. 4, *Synopseudes* free of shell. 5–9 *Terebra hoffmeyeri* Abbott.

paratypes in U.S.N.M. No. 596972; paratypes also deposited in the Museum of Comparative Zoölogy at Harvard, the Academy of Natural Sciences of Philadelphia, B. P. Bishop Museum in Honolulu, and the Philippine Bureau of Science in Manila. 200 paratypes were returned to Mr. and Mrs. F. K. Hadley of West Newton, Mass.

Other records.—Malate, Manila Harbor, P. I. P. Bartsch, coll.; Keledjitan, Bantam, Java. Bryant and Palmer, coll. 1909.

Remarks.—This species is closest in morphological characters to *Terebra clappi* Pilsbry, 1921, but differs from that Hawaiian species in having the following characters: base with a greatly to moderately swollen spiral cord; siphonal fasciole with two distinct spiral cords (although the internal columella bears only one); the base of the outer lip is strongly produced anteriorly and frequently twisted to the left to form a distinct siphonal canal. The Hawaiian specimens of *T. plicatella* Deshayes, 1857, are larger, more slender, uniformly colored a light yellow-brown and with the inner lip callous and considerably raised. U.S.N.M. No. 18268 contains four specimens of *T. plicatella* labeled as coming from the type locality, Van-Diemen [Tasmania] which agree with Deshayes' description and the Hawaiian specimens. This is what Pilsbry (1921) called *nitida* Hinds. On inspection of Hinds' figure of *nitida* (in Sowerby's Thesaurus, *Terebra,* pl. 45, fig. 103) and the original description (Proc. Zool. Soc. London, June 1844 (1843), p. 152. Marquesas.), I am impressed by its similarity with *T. clappi,* but hesitate to put the latter in syononymy until Hinds' type is seen.

T. hoffmeyeri is placed in the subgenus *Strioterebrum* Sacco, and in the section *Punctoterebra* Bartsch, 1923 (Type: *nitida* Hinds).

Some specimens of *T. hoffmeyeri* exhibit a remarkable development of the basal cord and the hooked and produced base of the outer lip, characters which, at first, would appear to be of generic significance. However, among the 300 specimens examined, there are many which almost entirely lack the basal cord and whose outer lip is not too greatly produced. The species shows an amount of morphological variation not often seen in this family.

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THREE NEW SPECIES OF TRIODOPSIS FROM NORTH CAROLINA

By LESLIE HUBRICHT

Triodopsis messana, new species.

Shell reddish brown, depressed, with conoidal spire. Narrowly umbilicate, the umbilicus contained 9 to 12 times in the diameter. Whorls 5½, slightly convex, deeply constricted behind the peristome. First whorl smooth, with weak short radial striae near the suture, later whorls radially striate. Reflected peristome white, thickened within, with a pointed to broadly rounded, inwardly bent tooth in the outer margin, and a transverse tubercle on the callus ledge in the middle of the basal margin. Parietal tooth rather long and angularly curved to arcuate. There is no internal tubercle on the columellar axis.

Diam. 12.0 mm. Ht. 7.1 mm. Holotype.
Diam. 10.9 mm. Ht. 6.4 mm. Paratype.
Diam. 12.8 mm. Ht. 7.5 mm. Paratype.
Diam. 15.0 mm. Ht. 8.7 mm. Laurinburg.
Diam. 8.8 mm. Ht. 5.8 mm. Wallace.

In many ways *T. messana* is intermediate between *T. fallax* and *T. hopetonensis*. It differs from the former in being darker colored (when fresh), and in wanting the internal tubercle. From the latter it differs in being more elevated, with a smaller umbilicus, and in usually having the teeth more strongly developed. I have had no difficulty distinguishing it from *T. fallax*, but small depauperate specimens are extremely difficult to distinguish from *T. hopetonensis*.

Some lots have the upper lip tooth pointed and little if any

inflected, in others it is broadly rounded and deep seated. The difference is a great as between *Mesodon inflecta* and *M. rugeli,* but there is complete intergradation.

T. messana is figured in H. A. Pilsbry, Land Mollusca of North America, Vol. 1, p. 810, fig. 480c.

Virginia: Nansemond Co.: just east of Suffolk. North Carolina: Northampton Co.: Rich Square. Bertie Co.: Windsor. Pitt Co.: Roadside, 2 miles southwest of Greenville; roadside, 4.5 miles southeast of Farmville, Beaufort Co.: pine woods, 9.5 miles west of Yeatsville. Johnston Co., Selma; Princeton; Benson. Craven Co.: railroad embankment, 4.3 miles north of Vanceboro; RR. embankment, 9.3 miles southeast of Vanceboro. Cumberland Co.: Fayetteville. Sampson Co.: pecan grove, Delway. Duplin Co.: Wallace. Onslow Co.: Richlands. Scotland Co.: Laurinburg. Robeson Co.: Maxton; Rowland; Lumberton. Pender Co.: Hempstead; roadside, 0.5 mile south of Rocky Point; Burgaw. Bladen Co.: White Oak. Columbus Co.: under logs, 3.2 miles northwest of Ash; Tabor City; Whiteville, holotype and paratypes, 188295 A.N.S.P., paratypes 10166, collection of the author. Brunswick Co.: Southport. South Carolina: Dillon Co.: Dillon; Latta. Darlington Co.: Darlington; Hartsville. Lee Co.: Bishopville. Florence Co.: Coward; Scranton; Lake City. Marion Co.: Marion. Horry Co.: pine woods, 2.5 miles east of Grean Sea. Berkeley Co.: St. Stephen.

I found a sinistral specimen at Dillon, South Carolina.

Triodopsis fulciden, new species.

Shell pale cinnamon-buff, spire depressed. Umbilicus narrow, deep and well-like, showing all the whorls. First whorl smooth, with weak short radial striae near the suture, later whorls costate, strongly papillose in the umbilical region and behind the peristome. Whorls 5½, slightly convex, sutures impressed, last quarter whorl rising slowly below, inflated above and turning abruptly downward behind the peristome. Strongly constricted behind peristome. Peristome white, somewhat dished, outer lip tooth inflected with a prominent buttress below. Basal tooth blunt, seated transversely on the lip-callus. Parietal tooth high, straight or slightly curved, entering slightly into the aperture, and connected to the end of the outer lip by a low buttress.

Diam. 8.1 mm. Ht. 4.2 mm. Holotype.
Diam. 7.2 mm. Ht. 4.1 mm. Paratype.
Diam. 8.8 mm. Ht. 4.6 mm. Paratype.

Type locality.—North Carolina: Catawba Co.: upland oaks woods, 3.4 miles west of Conover, holotype 188292, and paratypes 188290 A.N.S.P., paratypes 10935, collection of the author.

This species is unique in *Triodopsis* in having a buttress connecting the parietal tooth and the end of the outer lip as in many species of *Polygyra* and *Stenotrema*. *T. rugosa,* which it resembles in having a buttress below the outer lip tooth, has an aperture very similar to *T. tridentata.* Whereas the aperture of *T. fulciden* is more suggestive of *T. fraudulenta.*

Triodopsis pendula, new species.

Shell depressed, dull, pale cinnamon-buff. Embryonic whorl smooth, later whorls rib striate, strongly papillose in the umbilical region and behind the peristome. Umbilicus somewhat funnel shaped, the last whorl eccentric, twice the diameter of the preceding whorl, contained about 6 times in the diameter of the shell. Whorls 5½, slightly convex, sutures impressed, strongly constricted behind the peristome. Peristome white, somewhat dished, outer lip tooth rounded, slightly inflected, basal tooth blunt, set transversely on the lip callus. Parietal tooth slightly curved, high, and connected to the columella.

Diam. 11.3 mm. Ht. 6.2 mm. Holotype.
Diam. 13.7 mm. Ht. 6.7 mm. High Point.
Diam. 9.6 mm. Ht. 5.0 mm. Mt. Airy.

North Carolina: Stokes Co.: summit of Hanging Rock Mtn., Hanging Rock State Park, holotype 188293 and paratypes 188294 A.N.S.P., other paratypes A9637, collection of the author; upland woods, 2.5 miles southeast of Danbury. Allegheny Co.: 3000 ft., Roaring Gap. Surry Co.: Kalmia thicket, 3 miles southeast of Mt. Airy. Wilkes Co.: upland woods, 7.5 miles east of Wilkesboro. Forsyth Co.: upland woods, 3 miles west of Pfufftown. Guilford Co.: upland oak woods, 3.5 miles northeast of Jamestown; 2 miles west of High Point.

This species is related to *T. fraudulenta vulgata* and *T. neglecta.* Differing from the former in being smaller, more depressed, with a smaller, less dished aperture, the outer lip tooth is smaller and not as greatly inflected. From *T. neglecta,* which it resembles in its aperture, it differs in its much smaller umbilicus.

CREPIDULA MACULOSA CONRAD

By DALE V. STINGLEY

During a trip to Sanibel Island, Florida in 1948, the author collected a number of beach specimens of *Crepidula* showing unusual pigmentation. These specimens on superficial examination were classified as *C. fornicata* L. and temporarily forgotten.

However, in August 1949 and April 1950 on subsequent visits to Sanibel, heavy blows provided an abundance of live material and a more careful study led to the conclusion that this was a distinct species.

Examinations were then made of the collections of the Chicago Natural History Museum, Academy of Natural Sciences Philadelphia, United States National Museum and Museum of Comparative Zoology. This work disclosed that this species, with two exceptions, had been classified as *C. fornicata*. The exceptions being single examples from the west coast of Florida classified as *C. glauca* Say, and *C. maculosa* Conrad, respectively.

Consulting the literature disclosed that *C. maculosa* had been described in the Proceedings of the Academy of Natural Sciences of Philadelphia, Vol. 3, pp. 26–27 (1846) in an article entitled "Descriptions of New Species of Fossil and Recent Shells and Corals" by T. A. Conrad.

"*Crepidula maculosa.* Subovate; anterior side flattened; back acutely rounded; umbo compressed; color white, with irregular brown spots somewhat in ray-like series. Length 1⅛ inch. Breadth ⅞ inch.
Locality: Mullet Key, Tampa Bay."

Conrad, unfortunately, did not figure this species and the type presumably in the Academy of Natural Sciences Philadelphia appears to be lost. No. 188296 A.N.S.P., from the type locality, Mullet Key, has been designated a neotype. Several illustrations of *C. maculosa* have been erroneously designated *C. fornicata* L., and as a result, the former has been assumed to be a synonym for the latter. *C. maculosa* is, however, a valid species as the following expanded description and comparison with *C. fornicata* will show.

Crepidula maculosa Conrad. Plate 2, fig. 7–10.

Description.—Shell 25 to 35 mm. in length, uniformly convex and thin but strong, smooth except for minute sculpture of growth lines. Color; white with coarse irregular brown to blackish lines commonly broken up into spots or merged into blotches. Interior; white occasionally pinkish, with exterior pigmentation showing through. The apex is small, generally free and inclined dextrally. Aperture; oval. Diaphram; deep seated, slightly less than half the length of the aperture and extending into the apex. Free margin of diaphram uniformly and smoothly concave, slightly more extended on the left side. There is a prominent muscle scar anterior to the diaphragm on the right side.

The animal is a mottled silvery grey color, the foot being silvery white and attached both to the diaphragm and to the shell anterior to the diaphragm on the right side.

Comparison.—Special differentiation between *C. fornicata* and *C. maculosa* is based on major physical differences and the absence of continuously intergrading forms, where the two species occupy the same range.

Comparing *C. fornicata* with *C. maculosa,* we find first, that the edge of the diaphragm in *C. fornicata* is irregular and sinuously convex while *C. maculosa* is smoothly concave. The diaphragm in *C. maculosa* extends markedly into the apex, and the sides to the aperture approach the diaphragm at a nearly perpendicular angle. The diaphragm is also moderately deep seated. In *C. fornicata,* the diaphragm does not normally extend into the apex; the sides of the aperture usually approach the diaphragm at an angle greater than 90° and the diaphragm is shallow.

The apex of *C. fornicata* is coarse and commonly fused to the body whorl. The apex of *C. maculosa* is distinct and free. The shape of *C. fornicata* is irregular and greatly influenced by the surface to which it adheres. The shape of *C. maculosa* is regular and the aperture is consistently oval even in specimens deformed by their situation of growth.

A comparison of the animals of *C. fornicata* and *C. maculosa* brings forth major differences in anatomy. In *C. maculosa,* the attachment of the foot muscle to the shell results in a prominent muscle scar, which is almost completely absent in *C. fornicata* since the foot is attached mainly to the diaphragm. The foot of

C. fornicata is a rather uniform, slightly orange flesh color, while that of *C. maculosa* is silvery grey mottled.

It should be pointed out that the animal of *C. maculosa* closely resembles *C. aculeata* Gmelin in both color and anatomy, which may indicate that these species are closely related.

The range of *C. maculosa* cannot be fully determined from the material available. It is well established on the Florida west coast from St. Joseph Bay, south to Marco Island, but in the collections mentioned above, the only east coast record must be considered doubtful. The southern and western limits also cannot be defined. One lot collected by Pilsbry at Havana, Cuba, and another collected by Heilprin at Progreso, Yucatan, appear to be *C. maculosa.* However, in the author's opinion, this should be confirmed by an examination of preserved material before it can be definitely accepted that these are *C. maculosa.*

The writer is deeply indebted to Mr. W. J. Clench, Mr. John D. Parker and Mr. R. T. Abbott for their encouragement and cheerful assistance in making this study possible.

FURTHER OBSERVATIONS ON THE MOLLUSCA OF THE RELICT LAKES IN THE GREAT BASIN

By JOSHUA L. BAILY, JR. and RUTH INGERSOLL BAILY

(*Continued from p. 53*)

Lymnaea (*Stagnicola*) *hemphilli* (Baker)

Under strict application of the law of priority Henderson should be cited as the authority because his publication was the earlier, but since it was clearly the intention of both writers that Baker should be credited with the names we have cited him although well aware that the decision to do so may eventually be overruled.

Lymnaea (*Stagnicola*) *caperata* Say. Saratoga.

Lymnaea (*Polyrhytis*) *kingii utahensis* Call. Lifton; Ideal Beach; Saratoga, Geneva, Provo. This race, originally described as a variety of *Lymnaea ampla* Mighels (Call, 1884) and later raised to independent specific rank by the author (Call, 1886), appears to be the extant descendent of *Lymnaea kingii* Meek (1876) from the Pliocene beds in Cache County, Utah. Cer-

tainly the two are closely related as stated by Baker (1911). The chief difference appears to be in the columellar region of the peristome, which in the figure of the holotype of *Lymnaea kingii* given by Baker (loc. cit.) appears to be diagonal with a conspicuous fold, while in the figures of *Lymnaea utahensis* in the same work the columellar pillar appears straight and parallel with the axis. The latter form seems characteristic of our material but the range of variation is so great as to justify the assignment of *Lymnaea utahensis* to *Lymnaea kingii* as a subspecies.

Parapholyx effusa nevadensis Henderson. Toy; Pyramid Lake. The first record of this subspecies seems to have been by Dall (1870) under the name of *Pompholyx effusa solida* from Clear Lake, California. Later, Stearns (1883) commented on this form, stating that the original material had come from White Pine, Nevada, and that the type locality cited by Dall was erroneous. Still later Henderson (1934, p. 90, pl. 9 fig. 5–7) described a new variety from Winnemucca Lake to which he gave the name *Parapholyx effusa nevadensis,* and in the same publication he accorded specific rank to Dall's subspecies. In the same year, but subsequent to Henderson's publication, Pilsbry (1934) gave the name *Pompholyx solida optima* to a variety from Lake Bigler, Nevada. Finally, Baker (1945, p. 164) accorded full specific rank to both *Parapholyx nevadensis* and *Parapholyx solida* to the latter of which he referred Pilsbry's subspecies.

In a long series of these shells from Pyramid Lake the observable variation appears to efface the supposed differences among the forms mentioned above. The range of variation is tremendous, some specimens being thin and transparent while others are thick and opaque; some are smooth and others costate; in some the peristome is simple and in others it is flaring; in some the spire is flat and in others it is elevated; and these characteristics are united in every possible combination. Between the extremes every conceivable degree of continuous intergradation occurs, making segregation impractical if not absolutely impossible. If the distinctions among these forms be considered valid our Pyramid Lake shells will fall into *Parapholyx effusa nevadensis,* but if not they should be called *Parapholyx effusa solida.*

Carinifex newberryi Lea s.s. Lifton; Ideal Beach; Provo.

Carinifex newberryi occidentalis Hanna. Lake Tahoe. This is the paper-thin form characteristic of many northern California lakes.

Helisoma tenue Dunker. Pyramid Lake. Plate 4, fig. 12. This is a common species of the Mexican plateau. It is widely spread, specimens in the collection of the Academy of Natural Sciences indicating it to be known from many localities, among them Arizona; Humboldt Valley, Nevada; Estes Park, Colorado; San Diego County, California; and the Lerma River in Mexico. It is recognizable by the rather triangular aperture, the minute and close but usually quite distinct striae, and the small diameter of the upper or left cavity.

Modern specialists on this family (see Baker, 1945, p. 149) have divided this species into a half dozen or so subspecies, only two of which are found north of the Mexican border. To these have been given the names *Helisoma tenue californiense* Baker and *Helisoma tenue sinuosum* Bonnet. The two are practically indistinguishable. If we assume the Sierra Nevada Mountains to mark the boundary between the habitats of these two subspecies (a not unreasonable assumption) the Great Basin race will be *Helisoma tenue sinuosum* but we have not accepted this name because our material so closely resembles the figure of the type given by Dunker that we are unable to distinguish between them.

Helisoma subcrenatum Carpenter. Lifton.

Helisoma binneyi ursolacustre subsp. nov., Lifton. Plate 4, fig. 11. Holotype in the collection of the Academy of Natural Sciences, no. 187690. The large, coarsely striate *Helisoma* of Bear Lake and other localities in Idaho, Utah, and Nevada figured by Chamberlin and Jones (1929, p. 148, fig. 69) has been listed, according to Henderson (1929), under several names, such as *Helisoma corpulentum* Say, *H. binneyi* Tryon, *H. horni* Tryon, *H. pilsbryi* Baker, and apparently even *H. subcrenatum* Carpenter, but it does not agree very well with any of these species.

In comparison with specimens of equal diameter these shells may be seen to be significantly lower than those of *H. binneyi* or *H. pilsbryi* (which are probably equivalent to each other and which may be only varieties of *Helisoma trivolvis* Say) and sig-

nificantly higher than those of *H. subcrenatum* or *H. horni* (the identity of the latter is somewhat uncertain). On the umbilical or right side which is deep and vortex-like, showing two or three whorls, the whorls are rounded, differing from those of *Helisoma corpulentum,* which are somewhat angulated on both sides. The spire is shallow, with a prominent angulation on the periphery of the whorls, though the body whorl tends to become more or less rounded near the aperture. The surface is sculptured with coarse striae, generally well spaced, but sometimes locally crowded, especially near the aperture, which is decidedly wider in proportion to its length than that of *H. binneyi* s.s.

The size of apparently adult shells varies from about 20 mm. in diameter to over 30 mm. The figured type from Lifton, Idaho, measures: diameter 21.4 mm., height 10.5 mm.

In order to have a name certainly applicable to the shells which we and many others before us have collected from this region we are calling them *Helisoma binneyi ursolacustre.* We leave to specialists the task of deciding whether this is a subspecies or race of *Helisoma trivolvis* Say or of *H. binneyi* Tryon, or a species in its own right.

The name *Planorbis binneyi* was given by Tryon (1870) to the species which Haldeman had identified erroneously as *P. corpulentus* Say. The type locality of *P. binneyi* was the Lewis River, Oregon, Thomas Nuttall being the collector. According to Pennell (1936) Nuttall was on the "Lewis" or Snake River somewhere near the present town of Blackfoot, Brigham County, Idaho, and again he followed the river from the confluence of the Boise River to that of the Malheur River, Fayette County, Idaho, or on the Oregon side. This seems a more probable place for the collecting of *Helisoma binneyi.*

Gyraulus similaris F. C. Baker. Lifton; Saltair; Geneva; Saratoga; Provo; Toy; Topaz Lake; Diaz Lake. This is the most widespread mollusk in the Great Basin, and it is practically indistinguishable from the eastern species *Gyraulus parvus* Say.

Promenetus rubellus Sterki. Lakota.

Promenetus exacuous Say. Provo.

Ferrissia fragilis Tryon. Saratoga; Provo.

Physa triticea Lea s.s. Geneva; Provo; Diaz Lake. Specimens from Provo resemble *Physa blandi* Lea. This is the only mollusk we observed living in Utah Lake.

Physa triticea venusta Lea. Lakota.

Physa nuttalli Lea. Saratoga; Topaz Lake.

Physa virgata traski Lea. Saltair, Saratoga.

Physa virgata interioris Ferriss. Lifton; Ideal Beach; Walker Lake. This subspecies was named by Ferriss (1920) without a description, and referred by him to *Physa humerosa* Gould. The name acquired legal standing when Pilsbry (1930) published an illustration of the holotype. The latter author considered it a form of *Physa virgata* Gould, an opinion in which we wholeheartedly concur. Some of the Bear Lake material looks exactly like specimens in the collection of the Academy of Natural Sciences, and also like Pilsbry's figures, but others may vary to a somewhat more globose shape.

Neither Henderson (1924; 1931; 1936) nor Chamberlin and Jones (1929) list this variety from Bear Lake, but Henderson (loc. cit.) reports it from other Utah localities, and Chamberlin and Jones (loc. cit.) record *Physa virgata* Gould, presumably this subspecies, elsewhere in the state. These writers agree that there is only one *Physa* to be found in the lake, which they identify as *Physa ampullacea* Gould, a species which we did not observe there. But as we also believe that there is only one *Physa* to be found in Bear Lake we assume our material to be conspecific with theirs, and conclude that a difference of opinion exists among us as to its affinities. We do not wish to commit ourselves as to the validity of the variety *interioris* but we are convinced that it should be referred, not to *Physa humerosa* or to *Physa ampullacea* but to *Physa virgata.*

Physa lordi utahensis Clench. Geneva; Provo; Pyramid Lake.

Physa lordi zomos subsp. nov., Pyramid Lake. Plate 4, fig. 4. Holotype no. 187699 in the collection of the Academy of Natural Sciences. The great number of unrecognizable and unidentifiable terms which have been inflicted upon the species of *Physa* bear mute but eloquent testimony to the extent to which nomenclatorial artists have committed mayhem on this genus. So much so is this the case that Henderson (1924, p. 181) has written: "At present it is not possible to work out the synonymies of the western physas. Many species should doubtless be eliminated from the list, but I can not now tell where to place the records in the synonymies. Consequently they are presented just

as they were found, in alphabetical order. . . .'' He then proceeds to list 28 species and varieties with three others thrown in for good measure, and in a later publication (1936, pp. 126–31) adds ten more. It must be remembered that although these are referred to as ''western'' Physas neither of these treatises includes the records from the three Pacific coast states or Nevada.

A contributing factor to the ''origin of species'' in this sense is the varying degree of importance assigned by different writers to the expansion of the body whorl into a conspicuous shoulder. It is possible that in some instances this expanded shoulder may be of taxonomic significance but it seems likely that in many instances it is an adaptive structure. Pilsbry (1891) suggested that the form in these cases might be correlated with an increase in the capacity of the air-sac or lung which occupies that part of the shell, and that it might be the result of a more continuous or prolonged subaquatic existence.

Clench (1925) observes that these high shouldered forms are characteristic of large bodies of water of considerable depth, where oxygen is not readily available and where it must be stored up as it becomes obtainable. He is not convinced that the expanded body whorl is always the result of an ecologic factor, but feels that it is likely that it may be so.

The large *Physa* from west of the continental divide, *Physa lordi* Baird, has in the past frequently been confused with *Physa parkeri,* although the two seem to have little in common except the large size to which they attain. Clench (loc. cit. pl. 1, fig. 4, 6) has figured the types of both, and reference to his figures will facilitate the discrimination of these two species.

In the typical form of *Physa lordi* there is a shoulder well developed so that the greatest diameter of the body whorl tends to pass through the center of the parietal portion of the peristome. Specimens from Utah Lake lack this expanded shoulder, so that the greatest diameter tends to pass through the angle where the parietal and columellar portions of the peristome come together. To this form Clench (loc. cit., p. 8, fig. 5) has given the name *Physa lordi utahensis;* but Chamberlin and Jones (1929, p. 162, fig. 75) have raised this form to independent specific rank on the advice of Clench.

Specimens of *Physa* from Pyramid Lake resemble *Physa lordi*

in the absence of the shoulder on the body whorl and in the position of the maximum diameter, but they differ widely in their bodily proportions from both the typical form and from *Physa lordi utahensis.* In both of the named forms the greatest diameter is approximately equal to two-thirds of the distance between the apex and the most remote point on the margin of the aperture, while in the Pyramid Lake specimens these dimensions are approximately equal. In the language of physical anthropology the habitus of the Pyramid Lake specimens is pycnic whereas that of the other two races is esthenic. For this reason the subspecific name *zomos* from the Greek ζωμος "fat fellow" is here suggested for the Pyramid Lake form. The outlines of the types of the three forms are figured in the text.

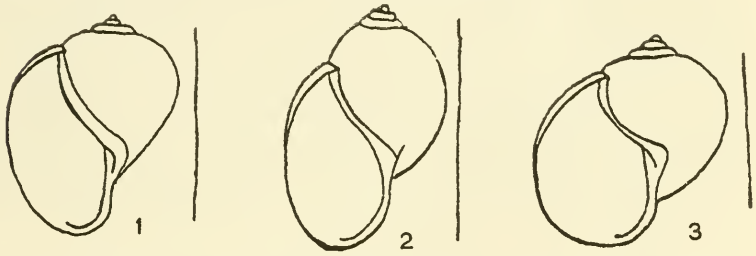

FIG. 1, *Physa lordi* Baird, after Binney. FIG. 2, *Physa lordi utahensis* after Clench. FIG. 3, *Physa lordi zomos* subsp. nov.

We feel that until more is known of the anatomy and physiology of the soft parts of these it is wiser to take the conservative attitude of considering them to be but variants of a single species.

Physa lordi zomos is of course not a newly discovered subspecies. It is inconceivable that a form which occurs in such abundance on the shores of Pyramid Lake should have escaped notice by all the field malacologists who have succumbed to the lure of this lake in the desert. The only surprising fact is that until now no one has seen fit to give it a new name.

Oxyloma haydeni kaibabensis Pilsbry. Provo.

Succinea nuttalliana Lea. Lakota.

The last two species are not, strictly speaking, aquatic mollusks, but their terrestrial habitat is always so close to water that it is convenient to include them in this investigation.

Conclusions

As a result of this investigation three facts stand out conspicuously which any students in the same field in the near future should continuously bear in mind. These may be briefly summarized as follows:

First, that the Hayden survey of Territories, despite the care taken by its members, overlooked many forms which modern writers would consider worthy of nomenclatorial recognition.

Second, the great variation in those forms of restricted range, and the discontinuous localities of those of widespread geographic range, seems to demand collecting in a much greater number of localities than we had ever considered might be necessary.

Third, the fact that the forms to which we have given new names are in no sense new themselves, but merely forms which older collectors had reported under various names which are not applicable, seems to indicate the need of a much more intensive study before a complete unification of minds can be achieved. Consequently we would urge those malacologists, paleontologists, and geologists who may be interested in Quaternary or late Tertiary faunas to turn their attention to the relict lakes in the Great Basin.

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AN OLD PROBLEM IN NAIAD NOMENCLATURE

By HENRY VAN DER SCHALIE

In 1942 Hans Modell published in the *Archiv für Molluskenkunde* a paper entitled: "Das natürliche System der Najaden." That article appeared during the Second World War and it was not till about two years ago that this work became available to me. The quotation of his closing paragraph presents a problem worthy of special consideration. Translated it reads:

"I am aware that it is impossible in this first draft to have arrived at the proper arrangement and I am pleased to look forward to corrections and improvements. It is otherwise regarding nomenclatorial problems especially as they concern the North American naiades where, since Simpson's subdivisions

did not suffice for these purposes, I had to go over completely to the coherent system of Frierson in order to be able to give a better picture. Thereby I had also to accept Frierson's concepts of Rafinesque's names in their entirety, although I know that these ideas are not shared by many North American investigators because Frierson's views are in part in opposition to the arrangements adopted by Ortmann, Pilsbry and Walker."

This statement brings to the fore an historic situation which it seems to me never has been generally appreciated by malacologists. In any reference to mussels a system of nomenclature must usually be adopted and the selection involves knowing what the available schemes are and what the relative merits of these arrangements may be.

The problem immediately arises: Why should we have the two systems referred to above by Modell? It is this situation which concerns us mainly and I shall do the best I can to give an honest and a fair appraisal of the historic conditions that led to the development of these two schools of thought.

As suggested by Modell the difficulties go back to Rafinesque. His work has caused trying nomenclatorial problems in Botany and Ichthyology, as well as in mollusks. Some interesting accounts are available to provide information about the life and travels of this naturalist. Perhaps the most popular memoir is David Starr Jordan's (1911) article, "An Eccentric Naturalist," in his *Science Sketches.* T. J. Fitzpatrick (1914) published a comprehensive account titled: "Rafinesque, A Sketch of his Life with Bibliography." In *Chronica Botanica* (Vol. 8, No. 2, 1944), the botanists made available a verbatim reprint of Rafinesque's own account entitled, "A Life of Travels." In a foreword to this reprint, E. D. Merrill of the Arnold Arboretum at Harvard has supplied some very interesting information concerning some of the special problems that relate to the man and his time. An unusually comprehensive work on the subject was printed in 1895 by a well-known conchologist, Robert Ellsworth Call, in "The Life and Writings of Rafinesque" which appeared as a Filson Club Publication and is not as readily available to students as it deserves to be.

Without entering into detail regarding the difficulties that existed in the early eighteen hundreds as they relate to the dissemination of information, much less to the special personality

traits that were characteristic of Rafinesque, there are a few problems that relate to Rafinesque's work which can not be ignored. David Starr Jordan (1911: 167) stated: " . . . And his failure seems due to two things: first, his lack of attention to details, a defect which has vitiated all of his work; and, second, his versatility, which led him to attempt work in every field of learning." Rafinesque is also said by Jordan (1911: 156) to have had "the ardor of the explorer without the patience of the investigator." E. D. Merrill in his foreword to the reprint of "Life of Travels" has summarized some of the problems which relate to Rafinesque's work in botany, as follows:

". . . His conclusions in various fields were not always sound, and about every disparaging adjective in the English language has been applied to him by this or that author. And yet, Asa Gray, one of his severest critics, in reviewing his botanical work in 1841, the year of Rafinesque's death, states: 'It is indeed a subject of regret, that the courtesy that prevails among botanists of the present day (who are careful to adopt the names proposed by those who even suggest a genus) was not more usual with us some twenty years ago. Many of Rafinesque's names should have been adopted; some as a matter of courtesy, and others in accordance with strict rules.' "

The same disregard for Rafinesque's work as just indicated in the field of botany also existed in conchology. Rafinesque himself was bitter about this lack of regard for his work and in his "Continuation of a Monograph of the Bivalve Shells of the Ohio River" in 1831 (as reproduced by Binney and Tryon in 1864, p. 71) he states:

"Since 1820, several American Conchologists have attempted to notice, describe, or figure these shells; Barnes, in 1823, Lea, Say, and Eaton, later still. They had a fine field before them, in elucidating them by good figures, and describing the new kinds; but led astray, by various motives, they have neglected to verify, or properly notice my previous labors, *although they were known to them.* Mr. Say, is, above all, inexcusable. I had respectfully noticed, in 1820, his previous labors; but he has never mentioned mine, and knows so little of the animals of these shells, as to have mistaken their mouth for their tail, and their anterior for the posterior part of the shells!"

It should be understood, then, that even after the appearance of Simpson's "Synopsis" in 1900 and his "Catalogue" in 1914,

there was still considerable uncertainty in the nomenclature of our North American mussels. For the next few years following the appearance of the Simpson "Catalogue" three of the most active naiad workers felt that the time had come to straighten out the confusion in the naiad names. Much of the early work along this line was done by correspondence among them and the letters of A. E. Ortmann, Bryant Walker, and L. S. Frierson on these nomenclatorial problems are all available in our Museum of Zoology. Their letters show that at first these men tried to work together so as to consider all of the arguments in each case and then to resolve their differences in an effort to come to a fair and sound conclusion. It soon became evident that L. S. Frierson was assuming the role of a champion and he became so obstinate that Ortmann and Walker decided to carry on their work without Frierson. The arrangement at that time was that each case would be carefully reviewed by both of them and when they had differences the several arguments pro and con would be submitted to Pilsbry who would act as a judge to make a decision that would be final.

In a letter to Bryant Walker from A. E. Ortmann, dated April 19, 1920, there are the following statements:

"Pilsbry has sent to me, last week, a bundle of Frierson's Objections etc., telling me that he has sent the same to you. He has asked me to send my comments on these to you, and that you may add your own, and send both to him.

"I do not think it worth while to go again into detail. In the cases of *Anodonta ohiensis, U. crassidens* (*dombeyana*), *U. cor, U. irroratus, Lemiox rimosus, Toxolasma lividus,* and *U. giganteus,* Frierson's arguments are not new to us. Indeed, *we have considered them,* and it is of no use for Frierson to repeat his arguments again and again.

"Only in one case, that of *U. teres,* I agree with Frierson, while you disagree. But we have concluded to leave the decision with Pilsbry, and if I can do so, and you can do so, I do not see why Frierson can *not!* Nothing could be fairer than that.

"Moreover, last Saturday I received a letter from Frierson in which he tells me not to mind him at all. And in a previous letter he hinted at the possibility, that, if we do not come around and approve his views he will act just as he pleases. Under these conditions, also, it is not worth while to spend any more time on him.

"Frierson seems to be offended that we do not accept *all* his

dicta as gospel-truth. He entirely forgets that we have accepted quite a few of his suggestions, published and unpublished, and he apparently does not see that our way of treating the subject is the only candid and scientific one. We want to be fair to all parties concerned, not only to Rafinesque, and we have no bias against anybody, none against Lea, and none against Frierson."

It is clear from this letter that it became impossible to continue to work with Frierson as a party to the revision of the Rafinesque names. But, the work among Ortmann, Walker and Pilsbry continued. Anyone who will take the trouble to see the voluminous correspondence, a revelation of the hours of time and patient work expended by these men, can not help but be impressed by the value of their contributions. Also, we must stress that seldom has there been a group better able to handle such problems. The scientific ability through patient study both in the field and laboratory of A. E. Ortmann, the legal background of Bryant Walker and his preeminence in the study of mussels, plus the unusually sound judgment of H. A. Pilsbry, combines to bring to bear experience and knowledge which few can question.

The considered judgments and the basic information resulting from several years of painstaking work were published by A. E. Ortmann and Bryant Walker in 1922 as an Occasional Paper (112) of the Museum of Zoology in the University of Michigan under the title: "On the Nomenclature of Certain North American Naiades." In the introduction these authors clearly stated the nature of the problem and their way of resolving special difficulties in an unbiased and legal way.

In 1927, just five years later, L. S. Frierson published his own version of a system which to him represented the proper way to resolve these same questions. His publication was privately printed under the title: "A Classified and Annotated List of North American Naiades." This booklet carefully avoids any mention of the work of Ortmann and Walker. I have been able to find only one reference to their work in a statement which fails even to cite the source of the quotation (see page 18 under *Anodonta* (*Lastena*) *ohiensis* Rafinesque). Another unfortunate aspect of this work is the lack of any references.

That Frierson was biased and wished to be a champion for Rafinesque is quite obvious from statements in the introduction

to his paper. There are several such clear indications but perhaps one quotation will suffice to dispel any uncertainty in this matter. After an historic review to indicate that Say, Barnes and Lea redescribed species which should have been credited to Rafinesque, Frierson (1927: 7) stated:

"But in quite a different spirit was Rafinesque's work treated by Lea. The latter published in 1836 a *Synopsis of the Naiades*, which was afterwards immensely enlarged in editions of 1852 and 1870. In these works Rafinesque was practically ignored as an author of species. This procedure, Lea undertook to justify on the plea that Rafinesque's descriptions were incapable of identification with any degree of certitude. He broadly hinted that the names credited to Rafinesque by Conrad, Say, and others, were arived at by '*guessing*'; and quoted sundry writers to the effect that, in their opinion, Rafinesque's mind was 'diseased,' and still worse, that he was 'in the habit of describing' imaginary objects. Lea lived for many years, was wealthy, and was enabled to publish sumptuously illustrated works, and accumulated an immense collection, left by him to the Smithsonian Institute. On the contrary, Rafinesque died in abject poverty, and left no one to champion his cause (*not, however, unchampioned altogether*), and his work has become practically unread, and his names buried in oblivion. Notwithstanding the immense debt owing to Dr. Lea by conchologists of all time, yet the time has arrived when personal reasons must be abandoned, and justice be rendered for Science's sake. . . ."

From these statements it would seem very unfair and contemptible to ignore the other fellow's work. Yet, Mr. Frierson, after criticising Lea and others for ignoring Rafinesque's work, had no hesistance in completely overlooking the careful paper by Ortmann and Walker which deals directly with the same subject to which he subsequently directed his attention! From Frierson's own statements it appears quite unlikely that he could be unbiased and render "justice" in these cases of disputed names. Also, it is of interest to find a statement by S. S. Haldeman quoted by T. J. Fitzpatrick (1911: 48) indicating that Rafinesque was not entirely without blame for the attitude shown toward him by his contemporaries, as follows:

"His greatest fault as a naturalist was not so much, perhaps, the shortness and resulting obscurity of his characters, as his passion for 'new species,' and the recklessness with which he proposed them, without sufficiently examining the works of his

predecessors. The author who pursues such a course, treats his fellow-laborers with disrespect, and prevents his works from being as much consulted as they may deserve; for there is nothing to compel other authors to wade through unsatisfactory descriptions, which must, in many instances, be referred to established species."

If, in the foregoing account, some of the facts that relate to this problem in the solution of resolving the arguments that relate tc disputed names of mussels have been brought to the attention of interested students, the purpose of these remarks will have been attained. Its seems to me we need not decide which system to adopt on any grounds other than the relative merits of work contained in the papers published to clarify these issues. The adoption of the Frierson system by Modell and others would seem much more worthwhile if those authors would produce evidence to indicate in which ways we can improve the arrangement given us by Ortmann, Walker and Pilsbry.

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A RICH LOCALITY IN THE NEW YORK CITY AREA

By ROGER BRETET and EDWIN J. CARSWELL

While making a survey of the land and fresh water mollusk fauna in a fifty mile radius around New York City last July and August, we found an amazingly rich locality situated in the southeastern part of Rockland County, between Piermont and Sparkhill, New York, along highway 9W. This spot is only some 13 miles north of the New Jersey terminus of the George Washington Bridge and hence well within the metropolitan region. The area is bordered by Valentine and Ferdun Avenues, conspicuously marked by Upper Ferdun Pond of Sparkhill Creek and spanned by a high steel bridge that supports the upper roadway of 9W. We had to make our way through weeds taller than ourselves to reach the southwest side of the pond. There we found the following species which were crawling on the pond's walls, under leaves of aquatic plants and on rocks:

Stagnicola palustris elodes (Say)
Musculium secure (Prime)
Musculium transversum (Say)
Pisidium variabile Prime
Valvata tricarinata (Say)
Promenetus exacuous (Say)
Physa heterostropha Say
Helisoma anceps (Menke)
Planorbula jenksii (H. C. Carpenter)
Amnicola limosa (Say)
Sphaerium rhomboideum (Say)
Sphaerium sulcatum (Lam.)
Lyogyrus pupoidea (Gould). (Only 1)

After getting all these fresh water species we started looking for land shells on a little wall probably built to be the foundation of a house and parallel to the pond at a distance of about ten feet. We did all our collecting in a seventy-five foot radius, always on the southwest side of Upper Ferdun Pond. Here the land mollusks were found in great abundance on the cinder covered ground, a sight most unusual in the New York area,

where the land snail fauna is quite sparse. We discovered large colonies of:

Anguispira alternata (Say)
Succinea ovalis optima Pilsbry
Zonitoides nitidus (Müller)
Zonitoides arboreus (Say)
Discus cronkhitei cronkhitei (Newc.)
Cionella lubrica (Müller).

Less common were:

Oxychilus draparnaldi Beck
Vallonia pulchella (Müller)
Gastrocopta contracta (Say)
Hawaiia minuscula (Binney)
Helicodiscus parallelus (Say)
Retinella binneyana (Morse)
Retinella indentata (Say).

Only one specimen of Carychium exiguum (Say) was found.

Under the overhead bridge, on the other side of Ferdum Avenue, we collected:

Anguispira alternata (Say)
Triodopsis tridentata (Say)
Triodopsis albolabris (Say)
Stenotrema hirsutum (Say)
Mesodon thyroidus (Say).

The following species have, to our knowledge, never previously been reported from the New York City area:

Sphaerium rhomboideum
Sphaerium sulcatum
Lyogyrus pupoidea
Succinea ovalis optima Pilsbry
Musculium transversum
Valvata tricarinata.

These last two are new to the New York City area but Jacobson reports he has collected them near Peekskill.

Oxychilus draparnaldi is apparently a recent arrival.

Discus cronkhitei cronkhitei: the finding of this last species indicates a definite extension of range since Dr. Pilsbry notes it no nearer to New York City than Dutchess County. The *Helix striatella* Anthony, reported by Hubbard from Staten Island (1865), has been assigned by Dr. Pilsbry to the subspecies *catskillensis* Pilsbry. The latter subspecies is abundant and widely distributed everywhere in a 50 mile radius about New York City, the locality in Sparkhill being the only one where we have found typical *cronkhitei.*

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A SOUTH AFRICAN SPECIES OF FAUXULUS

By H. A. PILSBRY

In looking over some recent accessions from South Africa in the collection of Mrs. H. B. Baker my attention was called to a white snail, at first glance like the Grecian clausiliid *Albinaria* in size and color. It turned out to be a species of *Fauxulus* (Pupillidae). It will be figured in the April Nautilus.

Fauxulus agulhasensis, new species.

The sinistral shell is nearly cylindric, the upper third tapering to the rather obtuse apex; imperforate, but with an oblique umbilical crevice. It is opaque white, uniform or with a few small gray dots and stains. The surface is glossy, the first two whorls smooth, the rest showing under the lens weak, irregular

obliquely axial striation. The whorls are moderately convex. The somewhat squarish aperture is about one-fourth the length of the shell, amber brown within, the peristome white, moderately expanded, with 5 or 6 lamellae and folds. The angular lamella is high and thin. Parietal lamella is more deeply placed and smaller, entering farther. Columellar lamella is quite small and deeply placed. The two palatal folds are about equal in size. There is also a very low basal fold in the type and another specimen (wanting in a third specimen).

Length 20.8 mm., diameter above aperture 6 mm.; 12 whorls.
Length 21.5 mm., diameter above aperture 5.7 mm.; 12½ whorls.

Cape Province: Cape L'Agulhas, collected by Mr. D. W. J. Ackermann of the Strand, South Africa.

Type 188332 ANSP.; paratypes in the collections of Bernadine B. Baker and of Mr. Ackermann.

This species is from about double to triple the size of *F. capensis* (Küster); 9.8 mm. long, 4 mm. wide being the largest measurement given for *capensis* by Connolly in his *Monographic Survey of South African Non-Marine Mollusca,* pp. 377–379. Most specimens of *capensis* are smaller, 6 to 8 mm. long. The length of *F. agulhasensis* is more than three times the width above aperture, but in *F. capensis* it is little more than twice the width.

The surface of *F. agulhasensis* is more coarsely striate than in *F. capensis,* the peristome is more expanded, and the columellar lamella is smaller, more immersed. However, the new form is so similar to *F. capensis* in color and apertural structure that if it were not for the conspicuous difference in size and relative width, it would hardly be considered specifically distinct. Quite normal *F. capensis* also was taken at Cape L'Agulhas.

THE MOLLUSKS OF BERKS COUNTY, PENNSYLVANIA

By ROBERT A. HEILMAN

Berks County, one of the larger counties of Pennsylvania, is situated in the southeastern section of the state and covers an area of 865 square miles. The northern section of the county

lies within the Appalachian Mountains, the southern lies within the Piedmont Lowlands, and the Great Valley passes through its center. Limestones, sandstones and shales of Páleozoic age form the soil of the county. The Schuylkill River provides the principal means of drainage.

Here in Berks County, the eastern most part of the Lebanon Valley, we find a total of 52 different forms of mollusks representing 34 genera and 18 families. Virtually all the aquatic species listed were collected by myself and are now deposited in the Carnegie Museum. The records of the terrestrial species are based mostly on the reports of Dr. H. A. Pilsbry (1899) and Mr. C. B. Wurtz (1940). The list of species follows:

Triodopsis tridentata (Say)
T. tridentata juxtidens (Pilsbry)
T. fallax (Say)
T. albolabris (Say)
Mesodon thyroidus (Say)
M. zaleta (Binney)
Stenotrema hirsutum (Say)
Ventridens ligera (Say)
V. suppressus (Say)
Retinella electrina (Gould)
R. rhoadsi (Pilsbry)
R. indentata (Say)
Hawaiia minuscula (Binney)
Zonitoides arboreus (Say)
Anguispira alternata (Say)
Discus cronkhitei catskillensis (Pils.)
Helicodiscus parallelus (Say)
Punctum minutissimum (Lea)
Pupoides marginatus (Say)
Gastrocopta armifera (Say)
G. contracta (Say)
G. pentodon (Say)
Strobilops labyrinthica (Say)
S. aenea Pilsbry
Vallonia pulchella (Müller)
V. excentrica Sterki
Deroceras laeve (Müller)
Pseudosuccinea columella (Say)
Stagnicola emarginata (Say)
Fossaria exigua (Lea)
F. obrussa obrussa (Say)
F. obrussa peninsulae (Walker)
F. modicella rustica (Lea)
Helisoma anceps (Menke)
H. trivolvis (Say)
H. campanulatum (Say)
Gyraulus parvus (Say)
Ferrissia rivularis (Say)
Campeloma decisum (Say)
Valvata tricarinata (Say)
Amnicola limosa (Say)
Elliptio complanatus (Dillwyn)
Goniobasis virginica (Gmelin)
Lasmigona subviridis (Conrad)
Strophitus edentulus (Say)
Alasmidonta undulata (Say)
A. marginata susquehannae Ortm.
Sphaerium sulcatum (Lamarck)
S. striatinum (Lamarck)
Pisidium compressum Prime
P. casertanum (Poli)

All identifications have been based on the shell rather than on body anatomy. Mr. Gordon K. MacMillan and Rev. H. B. Herrington assisted in the identification of species, and I express my gratitude to each.

NOTES AND NEWS

Another Colony of Discus rotundatus (Müll.) in the New York City Area.—Mr. Eddie Slater, a new member of the New York Shell Club, brought a lot of shells to the last meeting of the Club which turned out to be representatives of another colony of the European snail *Discus rotundatus* (Müller), the second found in recent months in the environs of New York City. Mr. Slater collected the shells on the premises of the old Grace Estate in Great Neck, Long Island. The specimens in every way resemble those found in Fort Tryon Park on Manhattan Island by Mr. Bretet (Naut. 65: 34). However, it is unlikely that the two colonies are in any way related, since there is a distance of some 18 airline miles between the two localities, in addition to a highly urbanized land area and the salt waters of the East River and part of Long Island Sound separating them. The clue to the origin of the Great Neck colony might lie in the landscaping activities of the gardeners of the Grace Estate. It is well within the realm of possibility that plants were imported from Europe and with them the young or eggs of *rotundatus*. Mr. Slater is trying to get in touch with the present owners of the estate, who live in South America, to check these speculations. At any rate, both of the present colonies (there may be others) must be of relatively recent origin, since no such species is mentioned in any of the early faunal lists of Long Island, the last as late as 1907 (list of Brooklyn Conchological Club, Vol. I, no. 1 of the Bulletin of the Brooklyn Conchological Club).—Morris K. Jacobson.

Correction of the Type Locality of Pomacea Cumingii (King) 1834.—The Type locality given by King in the original description in the Zoological Journal, Volume 5, page 344 is the *Island of Saboga,* in the Gulf of Panamá.

Specimens received by Isaac Lea from Cuming are labelled simply Panama (USNM No. 106162). One of these is of the size of the original dimensions given by King. Two others of this lot are of the size of the small race known from Pacheca Island, only about one inch in height.

Reeve, in the *Conch. Iconica,* Vol. 10, *Ampullaria* No. 81, pl. 17, fig. 81., incorrectly gives "Taboga" Island as the type locality, but figures the species correctly. Likewise, the specimen

received from Sternberg, and catalogued in (1859 ?) (USNM No. 4673) is labelled "Taboga." In 1946, I also followed Reeve, and gave the type locality as the "Island of Taboga." (Smith. Misc. Coll., Vol. 106, No. 6, p. 6.)

A specimen recently received from T. Pain, from the G. B. Sowerby III Collection, labelled as from *Taboga* Island, proves interesting. It is not the species *cumingii* from the Archipiélago de las Perlas, but is *zeteki,* otherwise known from the Isthmus of Panamá. (Smith. Misc. Coll., Vol. 106, No. 6, p. 8, 1946.)

From all the evidence at hand in the literature and in specimens, the type locality is correct as originally given by King, namely: *Saboga Island, Archipiélago de las Perlas Panamá.* The confusion has been caused by the similarity of names of the two geographically separate panamanian islands. It hardly seems logical to expect *cumingii* to be living on both Saboga and Taboga.—J. P. E. Morrison.

The Genotype of Microceramus.—In the course of preparation of radular slides for the forthcoming Monograph of Cuban Urocoptidae by Torre and Bartsch, the genotype species of *Microceramus* was critically reexamined, both in the literature and in specimens contained in the United States National Museum collections. A correction of the currently cited genotype was found necessary.

Pilsbry and Vanatta published *Microceramus* in January 1898 (Nautilus, 11: 107) including the species:

Macroceramus pontificus (Gld.)	[1848.]
Macroceramus floridanus Pilsbry	[nude.]
Macroceramus texanus Pilsbry	[nude.]

Five months later Pilsbry declared the two latter were undescribed (Nautilus, **12**: 22, June 1898) and proceeded to describe them on page 23. The name *Microceramus* is therefore based solely on the species *pontificus* Gould, in its earliest publication. The genotype was thus fixed by monotypy in January 1898, so that Pilsbry's subsequent declaration of *M. floridanus* as genotype (Proc. A.N.S.P., p. 281; July 12, 1898; Man. Conch., Vol. 16, p. 151, 1904; and Land Moll. N. America, Vol. 2, pt. 1, p. 108, 1946) are completely inoperative. *M. pontificus*

(Gould) is the genotype. This correction will result in no change whatsoever in the concept of the genus.—J. P. E. Morrison.

The Genotype of Microceramus.—In the preceding note Dr. Morrison stated that *Macroceramus floridanus* was a nude name is published in Nautilus, 11, 107. However, the name was followed there by the note: "Sarasota Bay and Goodland Point, Florida (= *M. gossei* of authors, part, not of Pfeiffer)." The authors who identified *M. gossei* from those places could only be W. G. Binney and others following him. Binney, under his description of *M. gossei* (Man. Amer. L. Sh., p. 416), gave the locality "Little Sarasota Bay near Charlotte Harbor, Florida." Hemphill collected it at Goodland Point. No other *Microceramus* is known from that far up the coast.

There could be no reasonable doubt as to the species intended by *M. floridanus* if nothing more had been published. A good many accepted names, including some published by as high an authority as W. H. Dall, have no better basis. While the suggested change of the type species of *Microceramus* seems needless, there is no great objection to it, since, as Dr. Morrison noted, it would make no change in the limits or characters of the genus. —H. A. P.

PUBLICATIONS RECEIVED

The Journal of the Washington Academy of Sciences has published a number of articles on recent mollusks in the last year in Vol. 41 (1951):

No. 1. Jan., pp. 14–16. R. T. Abbott, New stenothyrid gastropods from the Philippines (Rissoidae). (*S. austini* n. sp. and *S. austini clarki* n. subsp.)

No. 1. Jan., pp. 17–20. J. P. E. Morrison, Two new Western Atlantic species of pulmonate mollusks of the genus Detracia and two old ones. (*Detracia clarki* and *parana* n. spp.)

No. 1. Jan., pp. 20–21. D. Nicol, A new species of glycymerid from the Philippines. (*Axinactis* (*Melaxinaea*) *clarki* n. sp.)

No. 1. Jan., pp. 22–24. H. A. Rehder and R. T. Abbott, Two new recent cone shells from the Western Atlantic (Conidae). (*Conus clarki* and *austini* n. spp.)

No. 1. Jan., pp. 24–26. W. K. Emerson, A new scaphopod mollusk, *Cadulus austinclarki,* from the Gulf of California.

No. 3. Mar., pp. 102–106. D. Nicol. Recent species of the veneroid pelecypod *Arctica.*

No. 4. April, pp. 142–146. D. Nicol. Recent species of the cyrenoid pelecypod *Glossus.*

No. 4. April, pp. 146–147. P. Bartsch. More new urocoptid mollusks from Mexico. (*Coelostemma anconai* and *Holospira wilmoti* n. spp.)

No. 10. Oct., pp. 335–338. R. T. Abbott and H. S. Ladd; A new brackish-water gastropod from Texas (Amnicolidae: *Littoridina*). (*Texadina,* new subg. and *L. sphinctostoma,* n. sp.) —R. T. A.

Succinea vaginacontorta (Section Calcisuccinea), A New Amber Snail from Kansas. By C. Bruce Lee. Occas. Papers Mus. Zool. Univ. Michigan, No. 533. A species apparently related to *S. campestris* Say and *S. luteola* Gld., living in small spots of mosses, lichens and liverworts in thick stands of gramma grass, in a sagebrush flat in Meade Co., Kansas. Its special feature is a swollen twist at the base of the vagina.—H. A. P.

Les types de la collection Lamarck au Muséum de Genève. Mollusques vivants. II. By G. Mermod. Revue Suisse de Zoologie 58 (40): 693–753, figs. 51–93b.—Examples from Lamarck's collection, including several American species, are described and figured carefully. Species named in *Helix, Carocolla, Anostoma, Helicina, Pupa, Clausilia, Bulimus* and *Achatina* are included. *Helix planorbula* remains a synonym of *Polygyra septemvolva. Helix scabra* seems more heavily costulate than typical *Anguispira alternata.*—H. B. B.

Directory of conchologists. 1952. John Q. Burch, 1584 W. Vernon Ave., Los Angeles 62, Calif. 32 pp. $1.50.—This adds another very useful and up-to-date compendium of addresses and interests. But, arrangement by states and countries, although with some advantages, often makes the search for a name more difficult; for example, one finds Dr. Ramsden in the West Indies (p. 32) but not in Cuba (p. 17)—H. B. B.

THE NAUTILUS

Vol. 65 APRIL, 1952 No. 4

SOME INTERESTING LOCALITIES ON A COLLECTING TRIP TO MEXICO

By MORRIS K. JACOBSON

The combination of efficient automobiles and excellent roads has made trips to Mexico easy and common. Hence it might prove of some value to other collectors, who might like to undertake such a trip, to discuss a few localities a party of us visited in July, 1950. We are indebted to Dr. Pilsbry, for without the aid of his published papers on Mexican non-marine mollusks and his kindness in reviewing our finds, most of our species would probably not have been so well determined.

Our route from New York City took us through the Great Smoky Mountains, then via Tennessee and Arkansas to Woodward, Oklahoma; finally through eastern Texas down Mexican Highway 1 to Mexico City.

The stay in the Great Smokies was short. The July 4th holiday brought out hosts of picknickers and visitors, accommodations were difficult to get and the isolation necessary to throw one's heart into the task of searching for land snails completely absent. Even so a few specimens of the "Queen of the Mesodons," *M. chilhoweensis* (Lewis), which had sought refuge under an overhanging ledge near the Tuckaleechee entrance to the Park, went to enrich our meager haul.

About one-tenth of a mile east of the crossing of Swam Pond Road and U. S. Highway 70 near Kingston, Roane County, Tennessee, on a stony and sandy slope on the south side of the road, we found a particularly rich locality. We were surprised to find large numbers of *Pomatiopsis lapidaria* (Say) far above any obvious body of fresh water. Later we found considerable amusement in reading the thumping debate that Dr. Frank C. Baker conducted with Professor B. Shimek (*Nautilus* 44) as to the aquatic or terrestrial nature of this snail. Here we found

14 species of interesting land snails, most of them in satisfactory numbers. These included: *Polygyra plicata* Say, *Mesodon zaletus* (Binney), *M. thyroides* (Say), *M. rugeli* (Shuttleworth), *Stenotrema stenotrema* (Pfeiffer), *S. spinosum* (Lea), *Ventridens gularis theloides* (Walker & Pilsbry), *V. colisella* (Pilsbry), *Mesomphix subplanus* (Binney), *M. cupreus* (Rafinesque), *Discus patulus* (Deshayes) (very common), *Punctum blandianum* Pilsbry and one specimen of an undetermined *Retinella.* We also discovered that the numerous and large sized ticks can make collecting in the forests annoying; fortunately most of our specimens were found under stones in the open.

Quick stops involving that necessary but unsatisfactory mode of collecting usually referred to as "grab and run" in several localities in Arkansas and Oklahoma added small numbers of such interesting forms as *Mesodon inflectus* (Say) (near Conway, Faulkner County, Arkansas), *Polygyra dorfeuilliana perstriata* Pilsbry and Ferriss (in Pope County) and *P. dorfeuilliana sampsoni* Wetherby (six miles east of Mulberry on U. S. Highway 64, Crawford County, Arkansas). The last locality also yielded one live, mature specimen of *Stenotrema edgarianum* (Lea), several hundred miles west of its reported range in Bledsoe and Scott Counties, Tennessee (Pilsbry, Land Moll. of N. A., 1: 645).

The Panhandle of Oklahoma did not look like a very promising place for mollusks, but collecting proved satisfactory near the Fort Supply Dam and at the artificial lake of the Southern Great Plains Field Station near Woodward, Oklahoma. Here we found *Succinea concordialis* (Gould?), and representatives of the genera *Helisoma, Physa, Fossaria, Gastrocopta armifera* (Say), *Gyraulus, Ferrissia* and several pupillids, zonitids and a *Mesomphix.* The largest land mollusks of this area proved to be *Stenotrema monodon aliciae* (Pilsbry) which found in Boiling Spring State Park, where some of the forms already mentioned also turned up.

The trip through Texas was fortunately made on days that were intermittently rainy, so that incredible numbers of *Bulimulus dealbatus mooreanus* (Pfeiffer) (near Abbott, Hill County) were seen and large lots collected. Here we also found

Polygyra texasiana (Moricand) and *Mesodon roemeri* (Pfeiffer). We saw *Bulimulus* everywhere and near Waco we began to find large associations of *Praticolella berlandieriana* (Moricand) and *Rumina decollata* (Linné). A short rain near Troy, Bell County, brought out *Helicina orbiculata tropica* Pfeiffer as numerous as berries on the low bushes and shrubs. On the banks of a stream about 2 miles northeast of New Braunfels, Comal County, we found, in addition to the usual species, the following: *Tropicorbis gracilentus* (Gould), *T. obstructus* (Morelet), *Sphaerium subtransversum* Prime and a small *Polygyra* which in Dr. Pilsbry's opinion might prove to be a new variety or subspecies of *P. texasiana.* It is to be hoped that other collectors will send sufficient specimens of this snail to Dr. Pilsbry to permit a satisfactory conclusion. The locality is at the bridge on the main highway to San Antonio.

In Mexico our first important stop was made in Monterrey to visit the Topo Chico, a locality which was one of our main goals. This turned out to be a low elevation right outside of town, covered with small boulders and with very little vegetation. Here we found most of the species we had expected (cf. Pilsbry, Proc. Acad. Nat. Sci., 1903, pp. 761–789), but most, as the result of a long drought, quite dead. The commonest shell was *Polygyra rhoadsi* Pilsbry of which we found 180 specimens, including a half dozen live ones. We found also the usual *Bulimulus alternatus mariae* (Albers), *Helicina orbiculata tropica* Pfeiffer, *Praticolella berlandieriana* (Moricand), *Thysanophora horni* (Gabb), *Euglandina texasiana* (Pfeiffer) and an undetermined *Succinea.* This *Succinea* was also found clinging to the outer walls of our motel, the California Courts, where, as a consequence of the long drought, the animal had undergone complete desiccation. The best find on the Topo Chico was *Holospira topochicoensis* Bartsch, of which, however, we found only five dead specimens and several fragments.

Our next goal was the famous canyon 4 miles west of Ciudad Victoria in Tamaulipas State (Pilsbry, op. cit.). Upon inquiry we found that this canyon was known as the Cañón del Novillo and that Señor Arce of the neighborhood would be happy to take us there in an old Model A Ford. This car did indeed prove to be old, literally and actually held together with wire and

twine. The water was added at the last minute to make sure that enough would remain, despite the leaks, to bring us to our destination. We were fortunate too that Señor Arce decided to bring along an extra choke in the form of a companion, for when the car did indeed conk out on our way home in the dark, the latter seated himself on the fender near the motor and on the chauffeur's order, "Ahógalo!" placed his hand over the choke tube till the car started. On "Bastante!" he removed his hand. What more reliable than a living choke? When after a while this human auto part resumed his seat in the car, Arce explained that maybe, "The car she feex herself." The famous canyon proved to be a shallow, winding rocky dale, partially traversed by a small stream, overrun with grazing cows and goats and dry and dusty from the long drought. Shells were scarce and practically all dead except for *Mesomphix montereyensis victoriana* (Pilsbry) of which we collected 60 specimens. In rubbish which we took home to examine, we found a few specimens each of the following: *Thysanophora fischeri* Pilsbry (= *fuscula* C. B. Adams), *Discus victorianus* (Pilsbry), *Euglandina texasiana* (Pfeiffer), *Oleacina oblonga tamaulipensis* (Pilsbry), *Drymaeus discrepans* (Sowerby), *Microceramus mexicanus* (Martens), *Praticolella griseola* (Pfeiffer), *Lamellaxis tamaulipensis* (Pilsbry) (somewhat larger than the dimensions given by Pilsbry, op. cit., p. 776: 8.5 × 4 mm. as against 6.8 × 3.7). We were disappointed in not finding *Schasicheila hidalgoana* Dall, which Pilsbry (op. cit., p. 783) reported from the canyon.

We did however find this species and 13 others in the next locality, one of the richest we came across. This station is located between kilometers 636 and 637 (the Mexican system of marking every kilometer on their highways with noticeable stone markers makes the task of the collector much easier) near the hacienda "San Lorenzo," between the towns of Santa Inez and Llera in Tamaulipas. It is a boulder strewn hillside on the side of the road, well shaded with bushes, shrubs and trees. The same drought we had found everywhere followed us here too and hence our rich collection was even more surprising. We recommend this place strongly to collectors who might be able to visit it after a rain. Our best find here was a new

Streptostyla which Pilsbry subsequently described as *S. jacobsoni* in NAUTILUS, 64: 120. Another important discovery was *Polygyra aulacomphala* Pilsbry and Hinkley, which had been described from river drift near Tampico. Hence the find here serves to particularize the habitat of this species. The other species from this fine locality follow: *Drymaeus discrepans* (Sowerby), *Helicina zephyrina turbinata* Pfeiffer, *H. flavida* Menke, *Mesomphix montereyensis victoriana* (Pilsbry), *Microceramus mexicanus* (Martens), *Leptinaria tamaulipensis* Pilsbry, *Streptostyla gracilis* Pilsbry, *Euglandina corneola* (W. G. Binney), *E. texasiana* (Pfeiffer) and *Praticolella griseola* (Pfeiffer).

For the rest of the trip bad luck dogged us, or rather me as chief collector. The fascinating jungles near Tamazunchale had to go unexplored and the uplands of the plateau did not yield much to our hurried stops. The rivers were full—somewhere then there was rain in plenty—so that all the fine *Pachychilus* and naiads remained uncollected. At Xochimilco we found small numbers of all the species reported from there: *Lymnaea attenuata* Say, *Helisoma tenuis* (Philippi), *Physa osculans* Haldeman, *Succinea tlalpamensis* Pilsbry (?), *Anodonta impura* Say and *Sphaerium subtransversum* Prime. In the company of Miss Bourgeois of Mixcoac we visited the Desierto de los Leones to collect *Drymaeus sulcosus* (Pfeiffer), a beautiful corrugated shell with a vivid bluish pink or light brown aperture. However we did not find the *Humboldtiana* and *Bunnya bernardinae* H. B. Baker that are said to live on the old convent walls. In the Park of Chapultepec, where at one time the noble ahuahuete trees supported large populations of a unique *Drymaeus,* we found only the omnipresent *Helix aspersa* Müller. The volcanic country about the famous pyramids of Teotihuacan is relatively barren of shells, as are also the hills that lie between Mexico and Cuernavaca. All we got were some *Helix aspersa* when we asked some youngsters to bring us caracolitos.

Our road back home led us via Matamoros to Brownsville, Texas. Near the town of Jiménez on the Victoria-Matamoros road, our best find consisted of numerous *Polygyra ariadne* (Pfeiffer), dead specimens all in the very desert itself. The

completely closed umbilicus is very distinctive. The bushes near Matamoros were covered with hosts of aestivating bulimuli, but we were sated and collected only a small box full. Here we also found a few *Praticolella berlanderiana taeniata* Pilsbry. As should be added, there wasn't a single locality in the entire route through the deserts of Tamaulipas or southern Texas where we did not see *Bulimulus, Practicolella* and even *Succinea.*

We returned quite contented. Our trip had been done in complete comfort (except for Tennessee ticks) and we had found new and interesting shells. But it would be futile to deny that, as in all trips, we regretted missed opportunities. One of the most outstanding of these was a lush locality between kilometers 550 and 551 near Mante. We did not stop, but from the corner of our eye it looked so much like the snail rich mogotes of western Cuba that I am sure even a short visit will well repay the collector. I offer it free of charge.

SHELLS COLLECTED BY THE PEABODY MUSEUM EXPEDITION TO THE NEAR EAST, 1950. I. MOLLUSKS FROM THE PERSIAN GULF

By F. HAAS

The material to be named in this faunistic list was collected during the 1950 Peabody Museum Harvard Expedition to the Near East, by its leader, Dr. Henry Field. It was deposited with the Museum of Comparative Zoölogy at Harvard, Cambridge, Mass.; duplicates, where available, are now in the Chicago Natural History Museum. This material was entrusted to me for identification and I am by no means sure that I succeeded in doing so correctly in all cases, mainly for the reason that I lacked material for comparison; in some cases I even had to restrict myself to a generic classification, leaving the specific name open to further research.

Comparatively little is known on the marine mollusks of the Persian Gulf and thus even this short list will contribute toward a better understanding of this interesting area.

The individual localities, from which the species to be listed came, are recorded in the following numerated list which will make it unnecessary to repeat them in each case in the faunistic list.

List of Dr. Field's Localities

1. 5 miles south of Dubai, Trucial Oman Coast, Arabia; June 2, 1950.
2. Sharjah, Trucial Oman Coast, Arabia; June 3–5, 1950.
3. On low mound, 2 miles south of Sharjah, Trucial Oman Coast; June 3, 1950.
4. 15 miles south of Dubai, Trucial Oman Coast; June 2, 1950.
5. Abu Musa Island, 40 miles northwest of Sharjah, Trucial Oman coast.
6. Dukhan, Qatar Peninsula, Arabia.
7. Bahrain Island; May 25, 1950.
8. Ras-as-Zallak, west coast of Bahrain Island.
9. Badiya, northwest of Bahrain Island.
10. Ain-as-Saih, near Al Khobar, Hasa Province, Saudi Arabia; June 10, 1950. From kitchenmidden.
11. Kuwait.

Diodora funiculata (Reeve). Loc. 11.
Diodora excelsa (Reeve). Loc. 6.
Diodora candida (Reeve). Loc. 6.
Gibbula kotschyi (Philippi). Loc. 2, 6, 8, 9, 11.
Clanculus satrapius (Martens). Loc. 6, 11.
Umbonium (*Umbonium*) *vestiarium* (Linné). Loc. 2.
Isanda (*Minolia*) *tapparonei* (Caramagna). Loc. 6.
Phasianella (*Orthomesus*) *flammulata* Philippi. Loc. 6.
Turbo (*Lunella*) *coronatus* Gmelin. Loc. 2.
Turritella (*Haustrum*) *maculata* Reeve. Loc. 5.
Architectonium (*Architectonium*) *dunkeri* (Hanley). Loc. 5.
Bittium (*Bittium*) *tricarinatum* (Pease). Loc. 2.
Thericium rubens (Martyn). Loc. 6, 9, 10.
Clypeomorus clypeomorus Jousseaume. Loc. 2, 6, 8, 9.
Cerithium echinatum (Lamarck). Loc. 5.
Cerithidea (*Cerithideopsilla*) *fluviatilis* (Potiez & Michaud).
Turbonilla (*Tropacas*) *rüppelli* Jickeli. Loc. 2.
Canarium (*Canarium*) *floridum* (Lamarck). Loc. 2.
Polinices (*Neverita*) *ampla* (Gmelin). Loc. 2, 5.
Erosaria (*Erosaria*) *turdus* (Linné). Loc. 10.
Erronea (*Melicerona*) *felina* (Gmelin). Loc. 5.
Ranularia (*Gutturnium*) *lotorium* (Linné). Loc. 5.

Thais (*Cymia*) *carinifera* (Lamarck). Loc. 2.
Hexaplex (*Hexaplex*) *turbinatus* (Lamarck). Loc. 2.
Drupa (*Morula*) *concatenata* (Lamarck). Loc. 2.
Drupa (*Morula*) *siderea* (Reeve). Loc. 5.
Mitrella (*Mitrella*) *blanda* (Sowerby). Loc. 2, 6.
Fusus (*Fusus*) *colus colus* (Linné). Loc. 2.
Nassa (*Nassa*) *pulla* (Linné). Loc. 2.
Nassa (*Nassa*) *persica* Martens. Loc. 2, 10.
Niotha albescens splendidula (Dunker). Loc. 2.
Niotha clathratula (A. Adams). Loc. 2.
Bullia (*Bullia*) *mauritiana* (Gray). Loc. 5.
Oliva (*Oliva*) *elegans elegans* Lamarck. Loc. 2, 5.
Oliva (*Oliva*) *ispidula* (Linné). Loc. 1.
Ancilla (*Ancilla*) *acuminata* (Sowerby). Loc. 6.
Ancilla (*Ancilla*) *cinamomea* (Lamarck). Loc. 8.
Gibberula (*Gibberula*) *granum* (Philippi). Loc. 6.
Bulla (*Bulla*) *ampulla* Linné. Loc. 2.
Haminoea (*Haminoea*) *rugosa* E. A. Smith. Loc. 6.
Arca (*Barbatia*) *fusca* Bruguiere. Loc. 1.
Arca (*Arca*) *uropygmelana* Bory. Loc. 1.
Arca (*Acar*) *plicata* Chemnitz. Loc. 6.
Glycymeris sp. Loc. 1.
Brachidontes (*Hormomya*) *variabilis* (Krauss). Loc. 6.
Pteria (*Pinctada*) *inflata* (Schumacher). Loc. 1, 6.
Pecten (*Chlamys*) *senatorius* Gmelin. Loc. 1, 2, 5, 10.
Spondylus foliaceus Chemnitz. Loc. 4, 5.
Cardita (*Cardita*) *bicolor* Lamarck. Loc. 1, 2, 5.
Phacoides sp. Loc. 6.
Codakia (*Jagonia*) *fibula* (Reeve). Loc. 6.
Laevicardium (*Trachycardium*) *flavum* (Linné). Loc. 1, 2, 11.
Laevicardium (*Trachycardium*) *unicolor* (Sowerby). Loc. 5, 6.
Papyridea (*Fulvia*) *tenuicostata* (Lamarck). Loc. 6.
Macrocallista (*Paradione*) *nivea* (Hanley). Loc. 6, 10, 11.
Macrocallista (*Paradione*) *erycina* (Linné). Loc. 2.
Chione trigona (Reeve). Loc. 1, 2, 6, 8, 11.
Lioconcha lentiginosa (Chemnitz). Loc. 11.
Venus (*Antigona*) *lamellaris* Schumacher. Loc. 6.
Circe (*Circe*) *scripta* (Linné). Loc. 7.
Tivela ponderosa Koch. Loc. 1.
Dosinia (*Dosinidia*) *contracta* Philippi. Loc. 8.
Dosinia (*Dosinidia*) *laminata* (Reeve). Loc. 1.
Macoma sp. Loc. 6.
Tellidora sp. Loc. 6.
Angulus (*Peronaea*) *erythraeus* (Roemer). Loc. 8.
Angulus (*Peronaea*) *micans* (Hanley). Loc. 6.

II. Land and Freshwater Shells

The following list has been prepared by another, and a quite competent, specialist; thus no credit should be given to me for its publication.

Lebanon

From outside Marc Antonius rockshelter at Enfe on the right of the main road from Beirut (Beyrouth) to Tripoli the following were collected:

Helix pachya Bourg.
Levantina caesareana Mouss.
Monacha olivieri Fer.
Pomatias olivieri Sow.

Syria

Helicella seetzeni Koch. Mile 74.4 from Damascus to Palmyra and 7.6 miles before reaching Qariateine. Wadi Swaab between Iraq Petroleum Company Station T–3 and Abu Kemal. Wadi Serda, five miles south of Deir-ez-Zor on track to Iraq Petroleum Company Station T–2. Twenty miles due north of T–2 on track to Deir-ez-Zor.

Helicella vestalis joppensis Roth. On eastern slope of Jebel Abd al-Aziz, eight miles west of Hassetché (Hassecké) on the Khabur River.

Sphincterochila candidissima tholiformis Poll. Mile 74.4 from Damascus to Palmyra and 7.6 miles before reaching Qariateine.

Buliminus alepensis Pfr. Jebel Abd al-Aziz, eight miles west of Hassetché on the Khabur River.

Iraq

Helix salmonica Naeg. Sharranish near Zakho. Zakho. Jebel Baradost, Rowandiz Gorge. Twenty-one miles east of Kirkuk. Barrajo near Sulaimaniya. Four miles east of Erbil. Nine miles east of Shakhara. Abu Ghraib, fifteen miles west of Baghdad.

Levantina guttata Oliv. Jebel Baradost, Rowandiz Gorge. Hawiga near Kirkuk.

Levantina mardinensis Kobelt. Ishkafta Khurwatan, Kurdistan. Qaara Depression, north of Rutba Wells.

Sphincterochila candidissima tholiformis Poll. Three miles down wadi from Tell el-Afaif in Qaara Depression toward An Nasir and Rutba Wells.

Monacha schotti L.Pfr. Near Baghdad.

Buliminus alepensis urmianus Boettg. Sharranish near Zakho. Hawiga near Kirkuk.

Orcula orientalis moussoni Reinh. Hawiga near Kirkuk.

Helicella seetzeni Koch. Barrajo near Sulaimaniya. Three miles down wadi from Tell el-Afaif in Qaara Depression toward An Nasir and Rutba Wells. Qaara Depression, north of Rutba Wells.

Helicella langloisiana Bourg. Three miles down wadi from Tell el-Afaif in Qaara Depression toward An Nasir and Rutba Wells.

Helicella vestalis joppensis Roth. Zakho. Hawiga near Kirkuk. Tell Hatab east of Kish (Tell el-Uhaimir), Hilla *Liwa.*

Freshwater Shells

Melanoides tuberculata Müll. Lake Habbaniya. Abu Ghraib, fifteen miles west of Baghdad on Ramadi road. Hawiga near Kirkuk.

Viviparus bengalensis Lam. Hawiga near Kirkuk.

Melanopsis nodosa Fér. Abu Ghraib, fifteen miles west of Baghdad on Ramadi road. Tell Hatab east of Kish, Hilla *Liwa.*

Melanopsis costata Oliv. Hawiga near Kirkuk.

Corbicula consobrina Caill. Abu Ghraib, fifteen miles west of Baghdad. Tell Hatab east of Kish, Hilla *Liwa.*

Melanopsis buccinoidea subtinguitana Annand. Baghdad area. area.

Corbicula fluminalis Müll. Lake Habbaniya. Abu Ghraib, fifteen miles west of Baghdad. Tell Hatab east of Kish, Hilla *Liwa.*

Unio tigridis Bourg. Lake Habbaniya. Abu Ghraib, fifteen miles west of Baghdad. Tell Hatab east of Kish, Hilla *Liwa.* Tell el-Izba east of Kish, Hilla *Liwa.*

Unio elongatus eucirrus Bourg. Abu Ghraib, fifteen miles west of Baghdad. Nineveh near Mosul.

Pseudodontopis euphraticus Bourg. Abu Ghraib, fifteen miles west of Baghdad.

Anodonta taurica Bourg. Abu Ghraib, fifteen miles west of Baghdad.

Anodonta vescoiana Bourg. Lake Habbaniya.

Persia (Iran)

Helicella langloisiana Bourg. Fifteen miles south of Shalgahi on Dizful-Shustar road, Khuzistan. Outside Konji rockshelter, five miles south of Khurrumabad, Luristan. This rockshelter, which stands 700 ft. above valley floor, was inhabited by prehistoric man.

Helicella vestalis joppensis Roth. Persepolis (Takht-i-Jamshid). Dorud (formerly Bahrain) on Trans-Iranian Railway, Luristan. Shalgahi, ten miles southwest of Dizful, Khuzistan. Fifteen miles south of Shalgahi on Dizful-Shustar road, Khuzistan.

Monacha olivieri Fér. Shalgahi, ten miles southwest of Dizful, Khuzistan.

Monacha schotti L. Pfr. Shalgahi, ten miles southwest of Dizful, Khuzistan.

Buliminus egregius Naeg. Outside Konji rockshelter, five miles south of Khurrumabad, Luristan. Fifteen miles south of Shalgahi on Dizful-Shustar road, Khuzistan.

Buliminus alepensis urmianus Boettg. Persepolis.

Jaminia albula Mouss. Persepolis.

Orcula orientalis moussoni Reinh. Persepolis.

Freshwater Shells

Melanoides tuberculata Müll. Shalgahi, ten miles southwest of Dizful, Khuzistan.

Melanopsis buccinoidea doriae Issel. Shalgahi, ten miles southwest of Dizful, Khuzistan.

Theodoxus syriacus Bourg. Khurrumabad, Luristan.

Unio crassus bruguierianus Bourg. Zagheh between Khurrumabad and Dorud, Luristan.

SOME MARINE SHELLS USED BY PREHISTORIC INDIANS IN ECUADOR

By ROBERT J. DRAKE

In 1940 Edwin N. Ferdon, Jr. was conducting an archaeological survey in southern coastal Ecuador. He was assisted by John M. Corbett, the work being sponsored jointly by the School of American Research and the University of Southern California. For 6 months, in the fall and winter of 1940–41, the archaeologists carried out major excavations in one of the larger sites discovered. It was a shellmound on a cliff, 60 feet above the beach and just west of La Libertad (a town which lies about 147 kilometers west of Guayaquil by rail and is on the northern shore of the Santa Elena Peninsula). The excavation procedure used for this site has been recounted by Ferdon (1941a).

The large shellmound (1000 by 1500 feet) had not been too badly pot-hunted by amateurs; surface collections of artifacts indicated it might be, stratigraphically, a key site for understanding the prehistory of the entire region. Ferdon (1941b) has given a preliminary notice of the artifacts excavated from the shellmound on the cliff and which was designated as site E 2 g. They were of stone, clay, bone, wood, metal, and shell. Numerically, the shell artifacts outdid the other classes. These were turned over to the writer for identification of the species utilized in their manufacture and for typological study of the cultural forms, the last because of his interest in archaeological emphasis in the interdisciplinary field of ethnoconchology. Only the species identifications are reported here. Ferdon, at the Museum of New Mexico (in Santa Fe), is at present finishing his monograph on the archaeology of La Libertad, Ecuador. He has recently published a report on the geography of the region (1950).

As has been observed as usual with other large lots of ethnoconchological specimens from cultures employing considerable art work, most of the La Libertad shell artifacts were worked beyond possibility of even genus recognition. It may be possible, when Ferdon's reporting is finished, to make additional species identifications of those artifacts not dealt with now.

Only 86 shell artifacts, out of the 1100 odd, could be more or less positively determined as to the marine species used. In 9 more the genus is known. The writer is greatly indebted to Dr. Leo Geroge Hertlein of the Department of Paleontology, California Academy of Sciences, for making most of the determinations and advising on nomenclature.

Below are given determinations and number of specimens for each species. The artifact serial numbers, for reference, are given in parenthesis.

Natica cf. *catenata* Philippi, 1 (229)
Polinices uber (Valenciennes), 1 (988)
Trivia radians (Lamarck), 10 (239, 314, 546, 648, 751, 682, 869, 904, 933, 967)
Cypraea robertsi Hidalgo, 1 (82)
Malea ringens (Swainson), 1 (81)
Cymatium gibbosum (Broderip), 1 (30)
Anachis fulva (Sowerby), 1 (31)
Cantharus elegens (Gray), 1 (87)
Mitra gigantea Swainson, 1 (29)
Oliva incrassata (Solander), 1 (139)
Olivella columellaris (Sowerby), 9 (261, 290, 297, 315, 470, 597, 706, 753, 1102)
Olivella cf. *gracilis* (Broderip & Sowerby), 15 (33, 47, 90, 106, 123, 137, 206, 230, 221, 223, 274, 311, 312, 341, 507)
Olivella guayaquilensis Bartsch, 7 (258, 310, 458, 459, 812, 813, 854)
Olivella undatella (Lamarck), 6 (94, 97, 134, 143, 231, 363)
Olivella cf. *undatella* (Lamarck), 3 (442, 888, 1101)
Olivella volutella (Lamarck), 8 (524, 525, 526, 527, 583, 605, 997, 1027)
Olivella cf. *volutella* (Lamarck), 5 (201, 335, 401, 529, 597)
Olivella cf. *zanoeta* (Duclos), 5 (698, 706, 711, 735, 749)
Conus cf. *fergusoni* Sowerby, 1 (625)
Conus gladiator Broderip, 1 (224)
Conus cf. *princeps* Linnaeus, 1 (609)
Conus princeps lineolatus Valenciennes, 2 (117,684)
Bulla punctulata A. Adams, 1 (894)
Arca cf. *formosa* Sowerby, 1 (741)
Arca cf. *nux* Sowerby, 1 (111)
Glycymeris cf. *inaequalis* (Sowerby), 1 (216)
Pecten circularis Sowerby, 1 (1031)
Pitar concinnus (Sowerby), 1 (259)

Only the genera could be ascertained for the following: *Balanus,* 1 (104); *Dentalium,* 2 (65, 157); *Oliva* ?, 1 (725); *Olivella,* 2 (960, 989); *Conus,* 2 (681, 785); and *Strombus* ?, 1 (80).

The species are all from the current Ecuadorian marine fauna. Such is to be expected as the people of days gone by at site E 2 g perhaps were only moderately choosy of their materials for shell artifacts; they evidently had a plentiful supply and a good source in the immediate vicinity. Or, at least at times during the occupation (or occupations). It will be interesting to see if examples of some of the E 2 g shell forms turn up typologically and/or by species used some distances away in the cultural area of the time (or times) of the La Libertad shell-mound in question and sampled by Ferdon.

More species identifications in the bulk of the E 2 g shell artifacts perhaps could have been made had there been available for study a large collection of beach shells made near the site. Many simply formed artifacts were made of mere worn beach shells and fragments thereof; examples of such would have thus greatly facilitated comparisons and species determinations. Such a collection was made by Ferdon in 1941 but had to be left in Ecuador.

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SOME MOLLUSCAN TRAILS IN PRINCE WILLIAM COUNTY, VIRGINIA

By FRANK L. JEFFRIES

The locality records herein recorded, are taken from the author's field-book, and constitute a chronicle of his field trips

during the summers of 1948, 1949 and 1950, within the confines of Prince William County.

Formed in 1730 from the counties of Stafford and King George, and named for William Augusta of the House of Hanover, Prince William County has been the scene and locale of many epic events recorded in the pages of early Americana.

Southward, some thirty-five miles from the District of Columbia on U. S. Highway No. 29–211, the traveller enters the heart of the famed Bull Run battlefields, where were fought the first and second battles of Manassas. Crossing the Bull Run, which constitutes the dividing line between Fairfax and Prince William Counties, one pauses by the "Stone Bridge" where rested the "Confederate Left" on the early morning of July 21, 1861, and whence passed Pope's retreating army, August 30, 1862. Continuing on to other points within the county, one visits many historical shrines containing hallowed memories of yesteryear.

The wooded area of the county is characterized by an oak-hickory association, with many stands of Virginia pine. Oaks include: black oak (*Quercus velutina*); red oak (*Quercus borealis*); southern red oak (*Quercus rubra*); chestnut oak (*Quercus montana*); willow oak (*Quercus phellos*); post oak (*Quercus stellata*); and white oak (*Quercus alba*). Hickories include: mockernut (*Hicoria alba*); pignut (*Hicoria glabra*); and shagbark (*Hicoria ovata*). Other trees commonly occurring include: sweet gum (*Liquidambar styraciflua*); tulip tree (*Lirodendron tulipifera*); red maple (*Acer rubrum*); river birch (*Betula nigra*); Virginia pine (*Pinus virginiana*); and of course Virginia's own flowering dogwood (*Cornus florida*).

During a two day family outing in May of 1948, along the Occoquan River Gorge, from the town of Occoquan to a point approximately one and a half miles up stream, the following species were collected: *Mesodon thyroidus* (Say); *Triodopsis tridentata juxtidens* (Pilsbry); *Haplotrema concavum* (Say); *Anguispira alternata* form *angulata* Pilsbry; *Deroceras reticulatum* (Müller); *Philomycus carolinianus* (Bosc); *Marstoniopsis limosa* (Say); *Ceriphasia virginica* (Gmelin); *Pseudosuccinea columella* (Say); *Gyraulus parvus* (Say); *Physa heterostropha* (Say).

During the summer of 1949, the writer undertook and completed a project of collecting along the Bull Run from its source in the Bull Run Mountains of Loudoun County, to the point where it joins with the Occoquan River to continue on into the Potomac River. The following Prince William County records were secured:

Bull Run at Sudley Church: *Clappia virginica* Walker; *Ceriphasia virginica* (Gmelin); *Helisoma anceps bartschi* F. C. Baker; *Physa integra* Haldeman; *Elliptio complanatus* (Dillwyn); *Alasmidonta varicosa* Lamarck; *Sphaerium striatinum* Lamarck.

Bull Run approx. three quarters mile up stream from "Stone Bridge: *Campeloma rufum* Haldeman; *Ceriphasia virginica* (Gmelin); *Helisoma anceps bartschi* F. C. Baker; *Physa integra* Haldeman; *Strophitus undulatus* (Say); *Sphaerium striatinum* Lamarck; *Pisidium abditum* Haldeman.

Bull Run at Stone Bridge: *Stenotrema barbatum* (Clapp); *Mesodon thyroidus* (Say); *Triodopsis tridentata juxtidens* (Pilsbry); *Haplotrema concavum* (Say); *Retinella indentata* (Say); *Retinella burringtoni* (Pilsbry); *Ventridens ligera* (Say); *Zonitoides arboreus* (Say); *Anguispira alternata* form *angulata* Pilsbry; *Anguispira fergusoni* (Bland); *Succinea ovalis* (Say); *Elliptio complanatus* (Dillwyn); *Alasmidonta undulata* (Say). Both species of Unionidae were weathered shells from the flood plain, a recent rain having rendered the creek too muddy and deep for collecting purposes.

Bull Run between U. S. Highways 29–211 and 28. *Campeloma rufum* (Haldeman); *Ceriphasia virginica* (Gmelin); *Elliptio complanatus* (Dillwyn); *Elliptio productus* Conrad; *Alasmidonta undulata* (Say).

Woods paralleling the Bull Run down stream from U. S. Highway 28: *Retinella burringtoni* (Pilsbry); *Zonitoides arboreus* (Say); *Anguispira fergusoni* (Bland); *Succinea ovalis* (Say).

Little Bull Run just beyond Sudley Church at the point where the county road to Aldie crosses: *Elliptio complanatus* (Dillwyn); *Strophitus undulatus* (Say). NB: The map identifies this creek as Little Bull Run, however, a recent marker on the bridge crossing the creek calls it Cartharpin Run.

Chestnut Lick at point where U. S. Highway 15 crosses: *Fossaria humilis* (Say); *Helisoma anceps bartschi* F. C. Baker; *Physa heterostropha* (Say); *Anodonta cataracta* Say; *Sphaerium occidentale* Prime; *Pisidium abditum* Haldeman; *Pisidium compressum* Prime. Sieves were used to screen from marginal mud.

Young's Branch just across U. S. Highway 29–211 from the "Stone House": *Lyrogyrus granum* (Say); *Pseudosuccinea columella* (Say); *Fossaria humilis* (Say); *Helisoma anceps bartschi* F. C. Baker; *Physa heterostropha* (Say); *Sphaerium occidentale* Prime; *Pisidium abditum* Haldeman; *Pisidium compressum* Prime. All collecting at this station was within fifty feet of the highway. Sieves were used to screen from the marginal mud, the aquatic plant life and the rather gravelly bottom.

During the summer of 1950, extensive field trips were made into the region known as Prince William Forest Park. This eleven thousand acre tract of rolling woodland, formerly known as the Chopawamsic Recreational Area, is situated in lower Prince William County on the west side of U. S. Highway No. 1. The Park extends from the Quantico Marine Base, the village of Triangle and the historic village of Dumfries on the east, for approximately ten miles northwestward to Independent Hill. Terrain ranges from 100 to 400 feet above sea level. Both branches of Quantico Creek flow through the Park. Several organized group camps are sponsored and operated within the area by various organizations. The writer had the opportunity at close range to observe the wonderful work carried on by the Salvation Army amongst the underprivileged children of city slum areas. Records from this area have been grouped together for the purposes of this article, as space would not permit the listing of the many collecting stations. The following records were obtained: *Stenotrema hirsutum* (Say); *Mesodon thyroidus* (Say); *Triodopsis tridentata juxtidens* (Pilsbry); *Triodopsis fallax* (Say); *Triodopsis albolabris* (Say); *Haplotrema convacum* (Say); *Retinella rhoadsi* (Pilsbry); *Retinella indentata* (Say); *Retinella indentata paucilirata* (Morelet); *Retinella burringtoni* (Pilsbry); *Ventridens suppressus* (Say); *Zonitoides arboreus* (Say); *Anguispira fergusoni* (Bland); *Helicodiscus parallelus* (Say); *Philomycus carolinianus* (Bosc);

Pallifera dorsalis Binney; *Strobilops aenea* Pilsbry; *Strobilops labyrinthica* (Say): From the North Branch of Quantico Creek were taken: *Pseudosuccinea columella* (Say); and *Physa heterostropha* (Say). From the South Branch of Quantico Creek were taken: *Pseudosuccinea columella* (Say); *Helisoma anceps bartschi* F. C. Baker; *Menetus dilatatus* (Gould); *Physa heterostropha* (Say); *Elliptio complanatus* (Dillwyn); *Alasmidonta undulata* (Say); and *Sphaerium striatinum* Lamarck.

Acknowledgment is hereby expressed to Dr. Harold Rehder and staff of the United States National Museum for their constant encouragement, and especially to Dr. J. P. E. Morrison, for his long suffering and patience with this lay member of malacology, in checking and many times correcting identifications of specimens collected and listed herein.

The following may serve as a preliminary check-list of the mollusks of Prince William County, Virginia—Polygyridae: *Stenotrema hirsutum* (Say); *Stenotrema barbatum* (Clapp); *Mesodon thyroidus* (Say); *Triodopsis tridentata juxtidens* (Pilsbry); *Triodopsis fallax* (Say); *Triodopsis albolabris* (Say). Haplotrematidae: *Haplotrema concavum* (Say). Zonitidae: *Retinella rhoadsi* (Pilsbry); *Retinella indentata* (Say); *Retinella indentata paucilirata* (Morelet); *Retinella burringtoni* (Pilsbry); *Ventridens suppressus* (Say); *Ventridens ligera* (Say); *Zonitoides arboreus* (Say). Limacidae: *Deroceras reticulatum* (Müller). Endodontidae: *Anguispira alternata* form *angulata* Pilsbry; *Anguispira fergusoni* (Bland); *Helicodiscus parallelus* (Say). Philomycidae: *Philomycus carolinianus* (Bosc); *Pallifera dorsalis* Binney. Succineidae: *Succinea ovalis* (Say). Strobilopsidae: *Strobilops aenea* Pilsbry; *Strobilops labyrinthica* (Say). Viviparidae: *Campeloma rufum* (Haldeman). Amnicolidae: *Clappia virginica* Walker; *Marstoniopsis limosa* (Say); *Lyrogyrus granum* (Say). Pleuroceridae: *Ceriphasia virginica* (Gmelin). Lymnaeidae: *Pseudosuccinea columella* (Say); *Fossaria humilis* (Say). Planorbidae. *Helisoma anceps bartschi* F. C. Baker; *Gyraulus parvus* (Say); *Menetus dilatatus* (Gould). Physidae: *Physa integra* Haldeman; *Physa heterostropha* (Say). Unionidae: *Elliptio complanatus* (Dillwyn); *Elliptio productus* (Conrad); *Anodonta cataracta* Say; *Alasmidonta varicosa* (Lamarck); *Alasmi-*

donta undulata (Say); *Strophitus undulatus* (Say). Sphaeriidae:*Sphaerium striatinum* (Lamarck); *Sphaerium occidentale* Prime; *Pisidium dubium* (Say); *Pisidium abditum* Haldeman; *Pisidium compressum* Prime.

Angusipira fergusoni (Bland).

While collecting on Theodore Roosevelt Island (formerly known as Analostan Island), in the Potomac, at Washington, D. C. the writer collected both *fergusoni* and *angulata* from a common colony under the loose bark of a fallen tree. The tree sloped from the ground to a height of seven feet. More than fifty specimens of each were taken in all stages of growth, from very young to large adults, and in each case could be identified as either *fergusoni* or *angulata* beyond any doubt. No hybrids were apparent. This certainly would tend to support species status for *A. fergusoni* rather than form.

SOME MOLLUSKS FROM DOOR CO., WISCONSIN

By ALAN SOLEM

Haverford College, Haverford, Pennsylvania

During the first week of August 1951 the author vacationed at Toft's Point Hotel, Bailey's Harbor, Wisconsin. During this time collections were made at several localities in Door County. Since I was accompanied by a group of nonmalacologists, most of the collections were made hurriedly and in a cursory manner; in particular minute land shells were neglected.

Nevertheless, several species of interest were found and since some are not listed from Door County in Baker (1926) or Levi and Levi (1950), it was thought worthwhile to publish a complete list of species collected. Credit is due to Dr. Fritz Haas of the Chicago Natural History Museum for identification of the Sphaeriidae and checking my identifications of the Limnaeidae. Many thanks are also due to Mary Margaret Conkling for patient help in the collection of specimens. In the Succineidae, it was thought prudent to dissect material to confirm the classi-

fications made from the shells. The shells now comprise lots 992–1034 and 1090–1091 in the author's collection where they are available for study.

The following sites were visited:

(1). The most inclusive and complete collections were made on the Toft's Point Hotel property. It is a 270 acre tract of virgin pine timber on the west shore of Moonlight Bay (sometimes called Mud Bay) about three miles northeast of Baileys Harbor. The hotel is located on the shore of a small sand-bottomed cove, covered by a reed marsh. The lateral sides of the cove consist of rock outcrops. In back of the hotel is the virgin forest, predominately evergreen with some deciduous growth. The undergrowth consists almost entirely of thimbleberry (*Rubus parviflorus* Nutt.).

(2). About one-half mile south of the hotel is an open spot on the shoreline called Little Bayou. It is an exceedingly damp low area covered with piles of reeds tossed up during storms. A very prolific habitat both in species and actual numbers of specimens.

(3). Whitefish Bay is an extension of Lake Michigan about one-quarter of the way up the peninsula from Sturgeon Bay. This, I believe, is the locality from which Chadwick (1905–6) reported many land shells. Collecting was confined to the Cave Point side of the Bay from beach drift.

(4). Newport Beach is located on Lake Michigan just south of Europe Bay at the site of the now deserted village of Newport. This spot is of wide knowledge to local people and familiar to a few summer visitors. All specimens were obtained from beach drift in about fifteen minutes.

(5). Washington Island is located at the northern end of the peninsula, about 45′ 30° N latitude. It is separated from the mainland by the deep and treacherous "Death's Door" passage. At the north-west corner of the island is a small fresh-water lake about one acre in area called Little Lake. It is separated from Lake Michigan by about 200–300 yards of land. The Washington Island Museum is located on the south east shore of the lake. All specimens were collected in the immediate vicinity of the Museum.

The following species were collected. The numbers following the species refer to the localities above:

Allogona profunda (Say) 1, 2, 5.
Amnicola limosa superiorensis F. C. Baker 4.
Amnicola lustrica Pilsbry 4.
Anguispira alternata (Say) 1, 5.
Bulimnea megasoma (Say) 4 (very young).
Galba modicella (Say) 1.
Galba obrussa (Say) 4.
Goniobasis livescens Menke 4.
Gyraulus parvus (Say) 1, 4.
Helicodiscus parallelus (Say) 1, 4, 5.
Helisoma campanulatum (Say) 4, 5.
Helisoma trivolvis (Say) 1.
Lymnaea stagnalis jugularis Say 1.
Mesodon thyroidus (Say) 5.
Oxyloma retusa (Lea) 2.
Physa magnalacustris Walker 1, 4.
Planorbula armigera (Say) 3.
Pisidium compressum Prime 3.
Retinella indentata (Say) 1.
Somatogyrus tryonii Pilsbry & F. C. Baker 3.
Sphaerium (*Musculium*) *securis* (Prime) 1.
Sphaerium striatinum (Lamarck) 4.
Stagnicola emarginata canadensis (Sowerby) 3.
Stagnicola lanccata (Gould) 1.
Stagnicola walkeriana F. C. Baker 3.
Stenotrema fraternum (Say) 1.
Stenotrema monodon (Rackett) 1, 2.
Succinea avara Say 2, 5.
Triodopsis albolabris (Say) 1, 2, 5.
Valvata bicarinata perdepressa Walker 5.
Valvata sincera Say 2.
Valvata tricarinata Say 3, 4.
Zonitoides arboreus (Say) 1, 4.
Zonitoides nitidus (Muller) 1.

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THE STRATOGRAPHIC COMPOSITION OF A WOODLAND GASTROPOD POPULATION

By PHILIP H. KRUTZSCH

In order to attain a better understanding of the ecology of land gastropods a brief study was undertaken on April 6, 1948, on a small plot near the University of Kansas campus, Lawrence, Douglas County, Kansas. The area selected is situated in a small wooded ravine. An intermittent stream, active only during rainy periods, affords the only evident source of moisture. Neighboring these riparian conditions are fallow, weed covered fields.

A five foot square was marked off on the west-facing slope of the ravine. This area was selected at the juncture of the slope and a narrow plain adjacent to the stream-bed. The plot, shaded by osage orange and locust trees, had an understory vegetation of coral berry, weeds, and *Muhlenburgia*. The ground surface was covered by debris; this surface litter of old leaves, locust pods, twigs, bark, and rotting vegetation varied in depth from one to three inches. The soil of the hillside was black, granular, and loosely packed. The level area immediately adjacent to the stream bank had a surface covering of black soil, and at lower levels this became yellow and fine textured, with a high content of clay.

In order that a comparatively complete sampling of the snail population might be made, collections were made at various levels in the substratum by removing successively one inch layers from the entire study plot. The surface litter and the soil beneath was carefully examined to a depth of four inches. Temperature, soil moisture, and soil texture were noted at each level. The snails were removed by straining. Screens of two mesh sizes were employed (¼ inch and ⅛ inch). Possibly additional material might have been procured by use of a smaller mesh, but the moist, gummy soil prevented this.

The following is a stratigraphic account indicating soil type, moisture, temperature, and snail fauna collected:

Surface litter. Temperature of the surface litter was 46°F. Moisture in the form of water droplets was evident. The snail

population was greatest at this level. Forty-six individuals, representing seven species (see table 1), were obtained. Samples examined from various parts of the plot indicated a similar population over the entire area.

TABLE 1. SUMMARY

Depth in inches.....	Surface	1	2	3	4
Retinella indentata	11	2	1	2	3
Stenotrema monodon aliciae	2	0	0	0	0
Pupoides albilabris	1	0	2	0	0
Gastrocopta armifera	18	5	3	3	1
Gastrocopta contracta	2	0	0	3	0
Gastrocopta procera	1	0	0	0	0
Zonotoides arboreus	1	0	1	0	0
Total per level	46	7	7	8	4

One inch below the surface. Soil temperature was 48°F. Soil everywhere was moist; however, water droplets were absent. The soil was blackish and granular. There was a marked reduction in the number of individuals and species collected. Seven gastropods, representing only two species (see table 1), were obtained.

Two inches below surface. Soil temperature was 47°F; soil was moist and granular. Seven snails, representing four species (see table 1), were collected at this level.

Three inches below the surface. Soil temperature was 47°F; soil everywhere was moist. Soil on the hillside was black and granular. Six of the eight snails obtained were in this black soil. Soil on the flat was yellow, tightly packed clay; in spite of intensive and careful search only two snails were collected from this stratum. A total of eight individuals were found; these comprised three species (see table 1).

Four inches below the surface. Soil temperature was 47°F, soil everywhere was moist and clayish. Four snails, representing two species (see table 1), were found.

The species *Retinella indentata* and *Gastrocopta armifera* were most numerous at all levels; most individuals collected were living. Other species were represented by few empty shells.

Conclusions

1. In this woodland habitat, the greatest number of individuals and species apparently occur in surface litter.
2. The population appears to decrease in direct proportion to the depth below the surface.
3. Loose, granular soil is much preferred to tightly packed, clayish soil.
4. Small variations in temperature and moisture apparently have little influence on the presence or absence of land snails.
5. Most abundant species were *Gastrocopta armifera* and *Retinella indentata.*

INTRODUCED SPECIES OF LAND SNAILS IN NEW JERSEY

By ROBERT C. ALEXANDER

The land snail population of any civilized area is apt to include introduced species as well as native species. The introduced species may have come from some nearby locality or from a foreign land. Although such introductions are usually accidental, there are many cases on record in which snails have been imported deliberately for commercial and scientific reasons. Generally, accidental introductions are first observed where cultivated plants are grown or where soil has been brought in. Specimens collected in flowerpots, in gardens, on lawns and other similar places under cultivation may justly be open to the suspicion of having been introduced.

Once introduced species become established, they constitute as much an integral part of the land snail population of the locality where they live as the native element. However unless this foreign element can be readily recognized, it may become a source of considerable confusion to anyone attempting to solve the manifold problems of distribution. This confusion can be prevented to a certain extent by publication of reliable records noting the species that appear to be new to any particular locality.

Several introduced species of land snails have been collected in New Jersey. Some of them are well established in the state.

Cecilioides aperta is recorded from Princeton, Mercer County. This West Indian species was probably collected in a garden or greenhouse having been grought to this country on the roots of an imported plant. It is an isolated record and it is unlikely that the species still persists in this locality.

Three European species belonging to the genus *Oxychilus* have been found in New Jersey. *Oxychilus cellarium* was collected at Cape May, Cape May County, in 1933 and at Long Branch, Monmouth County, in 1926; *Oxychilus draparnaldi* at Gloucester, Camden County, undated; *Oxychilus alliarium* at Branch Brook Park, Newark, Essex County, in 1929.

The European slugs *Limax maximus, Limax flavus* and *Deroceras reticulatum* are widely distributed in the state. *Deroceras laeve,* a species indigenous both to Europe and North America, is probably the commonest slug here and the specimens collected are almost without exception of native origin.

While most introductions of land snails have been accidental, some have been intentional. William G. Binney, the conchologist, delighted in importing snails in order to observe their adaptability to a new environment. About 1860, he imported living specimens of *Triodopsis fosteri* which he released in his garden at 202 Union Street in Burlington, N. J. The specimens had been sent from Illinois by Robert Kennicott and, at that time, were identified as *Triodopsis appressa.*[1] They established themselves here and have thrived ever since. Dr. Pilsbry says of this species: "They are now abundant in suitable places all over town, and in 1909 I found them at least eight miles down the river at Plum Point, above Riverton, and in several intervening places along the Delaware River."[2] In 1924, Bayard Long collected two specimens at National Park, Gloucester County, about fifteen miles south of Riverton. Apparently they had come down the river on driftwood and, surviving a hazardous voyage past Camden and Gloucester, stranded in the vicinity of National Park, northwest of Woodbury, where they established themselves.

Distribution of land snails by the agency of water is not uncommon where seasonal freshets and floods inundate lands far

[1] Manual of American Land Shells, 1885, p. 288.

[2] Land Mollusca of North America, vol. 1, pt. 2, 1940, p. 832.

beyond the river banks carrying driftwood and whatever may be on it far and wide. The swollen waters of the Mississippi and other rivers have been instrumental in distributing certain species beyond the areas they inhabited originally, while at the same time forming an impassable barrier to other species. Less disposed to inundating floods than many rivers, the Delaware is not as important a factor in the distribution of land snails.

Another of Binney's importations was the European land snail *Cepaea nemoralis*. He established the earliest known colony of this species in America and wrote the following account about it: "In 1857 I imported some hundred specimens from near Sheffield, England, and freed them in my garden at Burlington, New Jersey. They have thriven well and increased with great rapidity, so that now (1869) the whole town is full of them. They retain the habit of the species of climbing hedges and trees, not remaining concealed under decaying leaves, logs, etc."[3] The history of Binney's colony of *Cepaea nemoralis* is continued by Dr. Pilsbry: "At the present time (1937), after eighty years, these snails are still confined to the town where they are abundant in some gardens and in several urban cemeteries and churchyards. I have not found them in surrounding country. Prominent features of the Burlington colony are the prevalence of red ground, and the large proportion of bandless shells."[4] The species is still abundant in Burlington.

Helicigona lapicida, Rumina decollata[5] and other imported species that Binney said he put in his garden at the same time as *Cepaea nemoralis* disappeared at once. However, Binney kept living specimens of *Rumina decollata* in his house as well as liberating them in his garden. He wrote: "I kept a number of individuals received from Charleston a long time as scavengers, to clean the shells of other snails. As soon as a living *Helix* was placed in a box with them, one would attack it, introduce itself into the inner whorls, and completely remove the animal. Leaving a number of *Succinea ovalis* Gld. with them one day,

[3] Invertebrata of Massachusetts, 1870, p. 430.

[4] Land Mollusca of North America, vol. 1, pt. 1, 1939, p. 10.

[5] This species, a native of the Mediterranean region, was first observed in this country at Charleston, S. C., in 1813 by Dr. Edmund Ravenel who said it was very common in gardens there.

the former disappeared entirely in a short time. The *Stenogyra* (*Rumina*) had eaten shell as well as animal."[6]

Vallonia pulchella, *Vallonia excentrica* and *Vallonia costata* are indigenous both to Europe and North America. Specimens collected in New Jersey should be considered to be native unless there is evidence to the contrary.

In August, 1898, Dr. Pilsbry collected specimens of *Vallonia pulchella* and *Pupoides albilabris* on mounds around the old gas works on Lafayette Street, Cape May, N. J., and reported that they "may possibly be imported species, as nothing of them was seen except in the old and long settled part of town."[7] The status of species such as these can often be determined with a fair degree of accuracy by the presence or absence of other records of the same species in the immediate vicinity.

In 1911, Dr. Pilsbry collected specimens of *Hawaiia minuscula* and *Helicodiscus singleyanus inermis* in a flowerpot in his home on Main Street, Riverton, N. J. The plant had been purchased at Dreer's nursery nearby .The specimens of *Hawaiia minuscula* were probably native since there are several records of this species from Burlington County and it is widely distributed in the state. The specimens of *Helicodiscus singleyanus inermis* may have been introductions since this is the only record from Burlington County. However, this species is native in the state too.

STUDIES ON MOLLUSK POPULATIONS: II

By R. STOHLER

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In connection with a study in this series, to be reported on at a later date, a fairly large number of *Olivella biplicata* Sowerby was collected in various localities along the California coast. Every effort was made to obtain as complete as possible a sample from a more or less carefully circumscribed area in each locality, including every individual present. Thus, what are believed to be unselected populations were obtained.

[6] Manual of American Land Shells, 1885, p. 457.

[7] Nautilus, vol. 14, no. 7, p. 74.

While the same material is being used for a statistical study, it also offered, because of the fact that it represents unselected populations from widely scattered places, a basis for a study on the color variations of this species. As Gifford and Gifford (1941) have shown, the color varies from white to almost black through various shades of gray, olive and brown. The exact color shades observed are very accurately described in the paper mentioned and may, therefore, be omitted here. It is sufficient to state that the present material includes all the shades mentioned by Gifford and Gifford. Also included is an occasional yellowish or orange individual, as noted by the same authors.

Vanatta (1915, p. 71/72) described a white variety as *Olivella biplicata lapillus* from San Pedro, California. As may be seen from the accompanying table, individuals corresponding to Vanatta's variety (here merely listed as "white") were found to a varying percentage in each of the localities. As was pointed out in the introduction to the current series of studies (Stohler, 1950), taxonomic recognition must be denied to individuals at the extreme ends of the normal range of variation of the species. *Olivella biplicata lapillus* Vanatta must, therefore, be relegated to the synonymy of the typical species, *Olivella biplicata* Sowerby.

The relatively uniformly small percentage of white individuals might be considered as an indication of the presence of a recessive Mendelian trait. On the other hand, the fact that various shades of colors are observed in a population could mean that multiple factors are at work, including, perhaps, blending inheritance. As Gifford and Gifford (loc. cit.) have indicated, only controlled breeding experiments could unravel this problem, which appears to be a rather complex one. At present, there is no hope for such a solution; on the other hand, a statistical analysis of large populations—much larger than are available at present—might give sufficient clues for a reasonable explanation of the variability in the color pattern of *Olivella biplicata.* This author hopes that these remarks may stimulate a number of collectors to gather carefully, from equally carefully circumscribed areas, large, unselected populations at yearly intervals and to analyze the color distribution with the aid of the "Dictionary of Color" by Maerz and Paul.

The results of these analyses might be pooled through the medium of THE NAUTILUS for an over-all final analysis.

Populations from the following California localities were studied:

1. Drakes Estero, Marin Co., collected July 30, 1946.
2. Duxbury Reef, Marin Co., between June 1 and October 12, 1950.
3. Pillar Point, San Mateo Co., June 29, 1950.
4. Monterey Harbor, Monterey Co.; collected by Cadet Hand, July 23, 1948.
5. Government Point, Santa Barbara Co., Aug. 17, 1948.
6. La Jolla, San Diego Co.; collected by R. Shaw, Dec. 27, 1948.

The color range and the relative numbers of "white" shells are given in the following table:

Lot	Color range, from white to	Total no.	Number "white"	
1.	dark chestnut	540	42	(7.9%)
2.	dark chestnut	1182	104	(8.7%)
3.	chestnut	450	49	(10.9%)
4.	very dark chestnut	1044	91	(8.7%)
5.	very dark chestnut	704	42	(5.9%)
6.	blackish gray	1108	55	(4.9%)

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THE GENERIC NAME PSEUDOTROCHUS

BY H. A. PILSBRY

The genus *Pseudo-trochus* was composed by J. T. Klein in his Tentamen Methodi Ostrácologicae, p. 26 (1753). The two species are *laevis* = *Liguus virginea* (L.) and *striatus* = *Telescopium telescopium* (L.) Klein's nomenclature was binary but not always binomial, and being prior to 1758 it has now only

historic interest. His system was noticed by Bruguière in his review of pre-Linnaean conchology (Encyclopédie Méthodique, 1789), *Pseudotrochus* on p. 530; and Herrmannsen, in his Indicis Generum Malacozoorum primordia enumerated some of Klein's genera, briefly giving their contents, *Pseudotrochus* in vol. 2, p. 341 (1847).

According to Opinion 5 of the International Commission on zoological nomenclature, "A pre-Linnaean name, ineligible because of its publication prior to 1758, does not become eligible simply by being cited or reprinted with its original diagnosis after 1757. To become eligible under the Code, such names must be reinforced by adoption or acceptance by the author publishing the reprint." Neither Brugière or Herrmannsen adopted the pre-Linnaean names they cited, and therefore did not validate them.

The first author, so far as I know, to accept *Pseudotrochus* was O. A. L. Mörch, in the Catalogus Conch. . . . Yoldi, 1852, as follows:

Pseudotrochus Kl., Chersina Humphr., Liguus Mtf.

445	2	virginea L.	Cuba
446	3	var. (Oxystrombus Kl.)	——
447	1	fasciata Müll.	——
448	1	lineata Val. Humb. Voy. t.55,f.2	——
449	1	crenata Sws.	——
450	2	var. sulphurea	——
451	1	var. lg. 73 m. A. fasciata var. ϵ Pfr. Reeve f. 35 c	
452	1	alabaster Rang.	I. Princip.

H. & A. Adams, 1855, in The Genera of Recent Mollusca, 2: 135, adopted *Pseudotrochus* from Mörch, enumerating all of his species and adding several similar species of *Liguus* and *Perideris*. They figured *alabaster* Rang as an example.

In March, 1904 (Man. Conch., 16: 220), the present writer designated *P. alabaster* (*Helix alabaster* Rang) type of *Pseudotrochus* H. & A. Adams. This species automatically became type of the identical genus *Pseudotrochus* Mörch. To my knowledge, no type had been designated prior to 1904.

It would have been better to have left *Pseudotrochus* in the synonymy of *Liguus* (as in Man. Conch., 12: 161), and make a

new name for the homonymous *Perideris;* but my course in 1904 was influenced by the examples of such men as W. H. Dall and J. A. Allen, who at that time favored the selection of a "type by elimination"—a procedure subsequently discredited. A great deal of water has passed over the mill of nomenclature since 1904. As matters stand, *Pseudotrochus* Mörch, with the type *P. alabaster* (Rang), is the proper generic name for *Perideris* Shuttleworth.

Finally, I feel that I owe an apology to readers of THE NAUTILUS for occupying space with anything so dull and uninteresting as nomenclatorial polemics. My excuse is that the validity of *Pseudotrochus* has been questioned, and my opinion was requested.

INFRA-SUBSPECIFIC TERMINOLOGY IN MARINE MOLLUSKS [1]

BY WILLIAM K. EMERSON

The problem concerning the proper use and meaning of trinominal [2] names has confronted systematic zoologists and paleontologists since the adoption of the international rules of zoölogical nomenclature. Originally no provision was provided for taxonomic units lower than the species level with the exception of subspecies. Unfortunately, subspecies were not defined but were mode co-ordinate in the rules with species (Articles 11, 12). This led to the utilization of a number of trinominal terms of diverse meaning and application. The lack of standardization is generally lamentable in all of the varied fields of systematic zoology and has become all too prevalent within many of the specialized branches.

Many taxonomists thus welcomed the proposed remedies as outlined by the Secretary of the International Commission on zoölogical nomenclature.[3] These changes in the rules require a trinominal name published prior to 1951 to be considered a

[1] Contribution no. 67 of the Allan Hancock Foundation, The University of Southern California.

[2] Subgeneric names are not considered in the determination of the number of taxonomic units comprising a species.

[3] Francis Hemming, The Bulletin of Zoological Nomenclature, vol. 3, pts. 1/3, pp. 55–62; pts. 4/6, pp. 63–68, London, 1950.

subspecies unless the original author definitely indicates that he regards the unit to be of infra-subspecific rank. After 1950, i.e., January 1, 1951, the procedure is changed so that the original author must indicate that a proposed unit is a subspecies and units not so designated are to be considered as infra-subspecific in rank. Inasmuch as infra-subspecific units are not governed by the laws of priority and homonymy, the same name is available to indicate similar features of form in the species comprising a single genus, several genera, etc., e.g., the descriptive name *major* could be utilized to indicate forms which are gigantic monstrosities of the species contained in a single genus, or all the genera comprising a family, etc. In cases where subsequent revisers raise infra-subspecific units to the status of subspecific or specific rank, the promoted unit can be given a new name or the original infra-subspecific name may be retained. In either procedure, the reviser's name is attributed to the new unit and priority commences at the date of the transfer. When the original infra-subspecific name is transferred particular caution must be exercised in assuring that the newly promoted unit name is not a homonym.

The trinominal units can be divided into two major categories namely, subspecies and infra-subspecific forms. A taxonomic subspecies is here accepted as being a geographically or reproductively isolated race or population of a polytypic species.[4] Infra-subspecific representatives of a species on the other hand, are considered to be units based on variations occurring in individuals or groups, and not necessarily confined to a single population. The infra-subspecific units can be subdivided into a number of categories, the most significant being genetic potentials of populations, e.g., color phases, increase in the number of whorls, etc., and ecological variations influenced primarily by environmental conditions which are evidenced by physiological responses, e.g., thickness of shell, extent of development of external ornamentation, etc.

While the application of the revisions of the rules may be more difficult in some fields than in others, these provisions seem to be especially applicable to the Recent marine mollusks (par-

[4] See Ernst Mayr, Systematics and the Origin of Species, pp. xiv, 334, New York, 1942.

ticularly for intertidal species). Trinominal assignments of proposed units require careful consideration. For example, in a recent issue of THE NAUTILUS the following citation appears, "*Urosalpinx cinereus* Say, var. *follyensis,* new form[1] [footnote] [1]Nomenclatural subspecies." Does the author propose this new trinominal unit to be a variety, form, or subspecies? Under the revised rules this confusing usage must be interpreted to be the proposal of a new subspecies even though the author apparently intended only to indicate the presence of an infra-subspecific form.*

While the differentiation between genetic forms and ecological varieties of infra-subspecific units is often extremely difficult, the writer believes that the distinction should be made when possible. For example, some gastropods which have a wide ecological tolerance produce a thickened shell lacking or reduced in development of spines when living in wave shock areas on an open coast, while representatives of the same species occurring in protected areas tend to have a thinner, larger shell with more spinose ornamentation, e.g., *Thais* (*Nucella*) *lamellosa, sensu lato.* A number of these ecological varieties have been given "subspecific" names. On the other hand, varietal and "subspecific" names have been proposed for genetic constituents of populations of the same species because of the possession of a color character not possessed by the "type," e.g., *Tegula gallina tincta.* It thus seems advisable to distinguish between these two basic infra-subspecific categories.

While a number of terms have been proposed to define minority elements of a rank below the subspecific level, the purpose of this paper is not to elaborate upon them. Since standardization is definitely needed, lest complete nomenclatural chaos result from the recent changes in the rules. I here recommend that infra-subspecific units of apparent genetic origin be indicated by using the word form,[5] e.g., "*Polinices* (*Neverita*)

* Systematics (science) and nomenclature (legal rules) should be kept in separate compartments of one's mind. If a new trivial term be worthy of publication, it should be given the same nomenclatorial status as a species, as was done for this (apparently ecologic) form.—H. B. B.

[5] The utilization of the Latin equivalents of these, *forma* and *variatio* respectively, would necessitate the use of the feminine gender for the descriptive terms.

reclusiana Deshayes, 1841, form *imperforata* Dall, 1909,'' and for units of apparent primary ecological influence the word variety[5] be used, e.g., ''*Ostrea lurida* Carpenter, 1864, variety *expansa* Carpenter, 1864.'' In both usages, the definite assignment of the proposed trinominal name to an infra-subspecific status should be made, preferably in the body of the text or at least as a footnote to the new minority unit.

While it is not my intention of advocating the indiscriminate use of infra-subspecific names, the above recommendations are proposed in an effort to obtain a stabilized terminology for taxonomic units of this rank.

A. M. STRONG

Conchology in the United States suffered a severe loss this past summer in the passing of A. M. Strong, widely known as a student and systematist and valued as a friend by all who knew him.

Archibald McClure Strong was born June 18th, 1876, at Westminster, Calif., son of Robert and Villa Marquis Strong, and passed away at Balboa, Calif., July 14th, 1951. In 1888, the family moved to Pasadena. This was his home until after his graduation from Stanford University in 1899, and during these years he became interested in conchology, as nearly as we can find out now in association with Senator Delos Arnold in some of the collecting on which Ralph Arnold later based a valuable study of the San Pedro Paleontology.

His early business life was spent in the Owens Valley (Inyo County, Calif.) as a mining and civil engineer. Among his activities here were work as Inyo County Surveyor, as chief engineer of the fabulous Cerro Gordo Mine, and an early survey of the Searles Lake potash deposits. At this time, he collected the first new molluscan species which I find credited to him—*Sonorella* (now *Micrarionta*) *argus* Edson.

In 1911 he moved his family to Los Angeles where he practiced as a consulting engineer for many years before retiring to Balboa.

He became a member of the Conchological Club of Southern

California in 1920 and was first elected to its presidency in 1927, filling that office several times.

After his retirement from business, he devoted much time to the classification of the shells collected by several scientific expeditions to the west coast of Central and South America, and alone, or in collaboration with various other conchologists, published a large number of valuable papers on conchology.

Among the organizations to which he belonged were: American Institute of Mining and Metallurgical Engineers, California Academy of Sciences, Southern California Academy of Sciences, American Malacological Union and the San Diego Society of Natural History. He will be greatly missed by all these groups.

He is survived by a daughter, Mrs. Lincoln Clark, and 3 grandchildren all of Balboa, Calif. to whom his fellow conchologists have expressed their sincere sympathy.—Elsie M. Chace.

NOTES AND NEWS

Annual Report A. M. U. for 1951.—Due to an error in binding, some of the 1951 report bulletins of the American Malacological Union are incomplete. Since the missing pages affect the membership list, this omission may cause inconvenience. The secretary requests that those members who received these faulty booklets notify her, and a correct copy will be mailed at once.—Margaret Teskey.

Another California Neritina.—Some years age (Nautilus, v. 22, no. 8, p. 93, 1907), I reported a find on the beach at La Jolla, California, of what I believed to be the species then known as *Neritina picta* Sowerby (Proc. Zool. Soc. London, p. 201, 1832) but which we must now call *Neritina luteofasciata* Miller (Malak. Blätt., n. s., v. 1, p. 168, 1879). Concerning the specific identity of this single specimen, there is some doubt, since the opportunity to compare it with authentically named material was not accorded me, and after the passage of nearly half a century I feel that it would be unwise to attempt its identification with anything greater than generic exactitude.

Recently I have been privileged to receive from Miss Sidney Brown, a resident of La Jolla, another specimen of Neritina taken from almost the identical locality as the earlier find.

Its specific affiliation appears to be, however, not with the West Mexican species but with *Neritina virginea* (Linnaeus) of the Atlantic. How its presence so far from home is to be accounted for I have no idea. The nature of the locality, a sand beach bounded by rocks below tide level seems to preclude the possibility that it may be established, for *Neritina luteofasciata* has a preference for estuarine waters whose salinity is considerably diluted, and I presume the same to be true of *Neritina virginea* as well, although I have never collected that species. Furthermore, vessels do not discard their ballast off the shore at La Jolla, so that the possibility that these may be ballast shells seems ruled out. Yet the coincidence, that these two specimens were taken in so nearly the same place, is of interest and seems to justify putting the finds on record.—Joshua L. Baily, Jr.

Paravitrea in Kansas.—In the course of work on a manual of the gastropods of Kansas, the following records have accumulated which represent a northwestward extension of range from the Ozarkian molluscan faunal province in Arkansas and Missouri into and beyond that part of the Ozark Plateaux which extend into the most southeasterly portion of Kansas. Catalogue numbers are those in the mollusk collection, Museum of Natural History, the University of Kansas.

Paravitrea capsella (Gould): No. 6771, 20 specimens, 7 mi. E. Baxter Springs, Cherokee Co., Kansas, Sept., 1943, D. S. Franzen, collector.

Paravitrea significans (Bland): No. 6535, 16 specimens, 7 mi. E. Baxter Springs, Cherokee Co., Kansas, Sept., 1943, D. S. Franzen, collector; No. 6841, 2 specimens, Pottawatomie Creek, 4–5 mi. N. Garnett, on U. S. Highway 59, Anderson Co., Kansas, Nov. 18, 1950, Glenn R. Webb and Robert W. Reese, collectors.

Paravitrea simpsoni (Pilsbry): No. 6763, 1 specimen, 7 mi. E. Baxter Springs, Cherokee Co., Kansas, Sept., 1943, D. S. Franzen, collector.—Ernest J. Roscoe, University of Kansas Biological Survey.

Amnicola pilsbryana, new name.—Charles B. Wurtz has informed us that our name *Amnicola pilsbryi*, Nautilus, vol. 65(2), p. 50, is preoccupied by that of Bryant Walker, 1906, Nautilus, vol. 19(10), pp. 116–7. We therefore substitute *A. pilsbryana*.—Joshua L. Baily, Jr., and Ruth Ingersoll Baily.

Vol. 65 JULY, 1951 No. 1

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EDITORS AND PUBLISHERS
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